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NEW CRUSHING AND GRINDING MILL.

Fig. 1

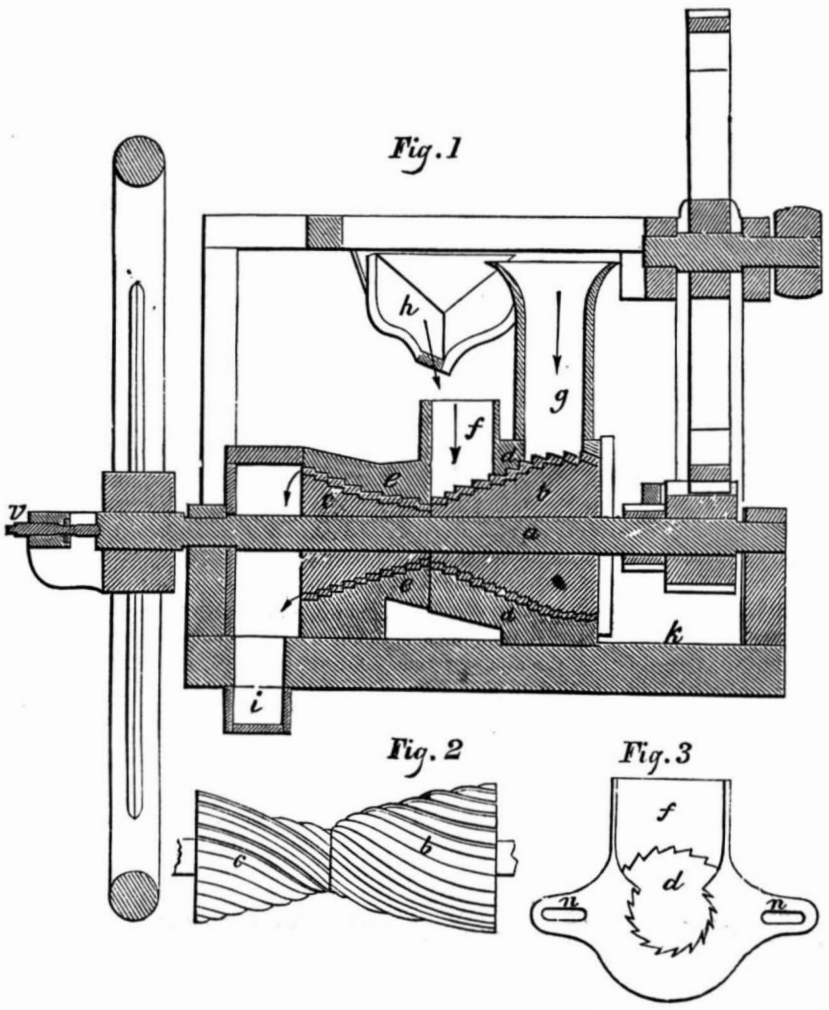


Fig. 2

Fig. 3

Crushing and Grinding Mill.

The annexed figures represent the improved machine for grinding corn and cobs, for which a patent was granted to Joel Weigle, of Swan Station, Erie Co., Pa., on the 6th of February.

Figure 1 is a longitudinal section of the machine, and figures 2 and 3, represent detached views of it. Similar letters refer to like parts.

The nature of the invention consists in forming a crushing and grinding apparatus by uniting with each other upon the same shaft, the smaller ends of two corrugated segments of cones, and combining with them corrugated inclosing casings supplied with two feeding apertures, and arranged in such a manner that corn and cobs can be fed into one opening, and ground shelled corn be fed into the other aperture and be converted into meal.

Figure 3 represents the united corrugated conical grinders attached to their shaft, and detached from the machine. The grinder, *b*, it will be perceived, is larger and has coarser corrugations than the grinder, *c*. The portion, *d*, of the casing which incloses the grinder, *b*, is secured to the platform, *k*, of the frame of the machine in such a manner that it can be moved laterally. This is accomplished by forming slots in the supporting ears, which project from the base of the casing for the reception of the screws, which confine the said casing to the platform, *k*. The casing, *e*, which incloses the grinder, *c*, is secured to the platform, *k*, by ears and set screws. The casings, *d* and *e*, are combined with each other by means of the lateral ears, *n n*, figure 3, projecting from the inner end of the former, and the ears projecting from the latter united to each other by screw bolts. The ears, *n n*, have slots in them, for the bolts to work in, and which allow the said casing, *d*, to be moved laterally upon the platform, *k*, for the purpose of producing a wider space between the descending side of the grinder, *b*, and its casing, than there is between the opposite side of the grinder and its casing, and to vary the same as circumstances may require. Corn and cobs are fed into the machine through the vertical tube, *g*, which rises from the casing, *d*, opposite the largest end of the grinder, *b*. They are first operated upon between the corrugated surfaces of the grinder, *b*, and its casing, the corrugations of which are of such a shape as to carry forward the stuff operated upon to the small end of the casing, *d*, and discharge it into the space between the grinder, *c*, and its casing, *e*, which carry it forward and discharge the same into the delivery trough, *i*. When shelled corn is to be ground in this improved mill it is fed from the hopper, *h*, into the receiving aperture, *f*, which opens into the casing, *d*, above the smaller end of the grinder, *b*. When it is desired to grind the meal finer or coarser the set screw, *v*, is turned to vary the distance between the grinder, *c*, and its casing, *e*. And when it is desired to vary the fineness or coarseness of the provender formed of cobs and corn in this mill, the casing, *d*, is moved laterally, so as to increase or diminish the space between the ascending side of the grinder, *b*, and its casing. Both the corn and cobs, and the shelled corn, are first crushed by the action of the grinder, *b*, and its casing, and are then ground finer by the action of the grinder, *c*, and its casing, *e*. The corn and cobs passing from the largest to the smallest end of the grinder, *b*, and then from the smallest to the largest end of the grinder, *c*, get thoroughly ground and incorporated with each other, more so, it is believed by the patentee, than in any other mill that has ever been devised. When it is desired to grind provender coarsely and rapidly, the casing, *d*, is so adjusted as to leave equal space on all sides of the grinder, *b*, at the same time that ample space is given (by means of the set screw, *v*) between the grinder, *c*, and its casing, *e*.

More information may be obtained by letter addressed to the patentee, Mr. Weigle.

CAST-IRON DRIVING WHEELS.

Fig. 1

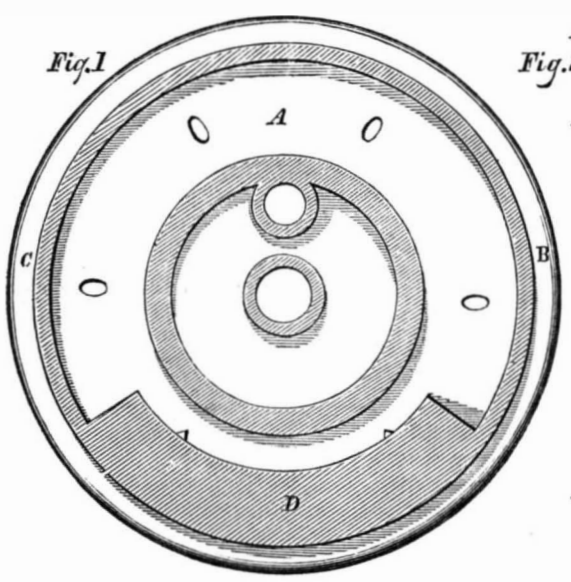


Fig. 2

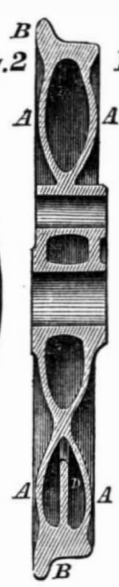
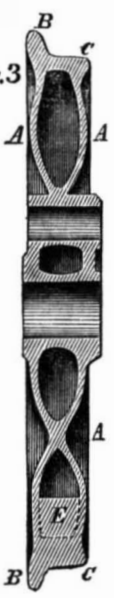


Fig. 3



The accompanying engravings represent an improvement in casting a counterbalance on double plated chilled cast iron railroad driving wheels, for which a patent was granted to Henry A. Chase, of Boston, on the 23rd of May, last year.

Figure 1 is a vertical longitudinal section of a chilled driving wheel having the improvement applied. Figure 2 is a vertical transverse section of the same. Figure 3 is a vertical transverse section of a similar wheel, with the counterbalance cast on it in the ordinary way. The view is merely shown to illustrate the invention more fully.

The nature of the invention consists in casting the counterbalance upon the inner face of the tread of the wheel in such a manner that it will be free and independent of the two side plates forming the wheel, and at the same time be supported by said tread in the most perfect manner. This method of casting the counterbalance renders the two plates of the wheel equal in thickness over their whole surface, and, consequently, they expand or contract equally at all points, while the counterbalance is left free to expand to any extent, without exerting strain on those parts of the wheel which so commonly break during the casting process, or while in use, on account of the counterbalance being cast solid with the tread and side plates of the wheel, thus making additional surface, and consequently causing unequal contraction or expansion at different points.

A A B and C represent a hollow chilled driving wheel of the ordinary construction, having the improvement applied to it; A A representing the two side plates, B the flange, and C the tread of the wheel. D is the counterbalance, cast on the inner face of the tread, C, and independent of the plates, A A, as seen in figs. 1 and 2, and extending from the tread, a short distance, toward the center of the wheel. And as it is made thin and light, it must be made to extend round the tread a suitable distance, to give the required weight to counterbalance the wheel. By examining fig. 3, the ordinary counterbalance, E, will be seen, and by comparing it with the counterbalance D, fig. 1 and 2, the utility of the latter will be apparent, for it will be understood that if the counterbalance, E, be employed, an additional solid surface is formed in the wheel, and consequently unequal contraction or expansion, and strain and breakage of the wheel at certain points will be experienced, whereas, if the counterbalance, D, be used, no such result will be felt, for all the parts are free and independent, and can expand without straining or injuring each other.

The claim is for casting the counterbalance, D, upon the inner face of the tread, C, of the wheel, and independent of the two side plates, A A, forming the wheel.

More information may be obtained by letter addressed to Mr. Chase, at the Boston Locomotive Works, Boston.

Yellow Fever Prevented by Inoculation.

La Cronica, a Spanish journal in this city, says that Dr. W. L. Humboldt, has discovered means to prevent yellow fever, by inoculation. The Government of Cuba, as *La Cronica* is informed, has directed the inoculation of the major part, amounting to one thousand, of the newly arrived troops, which has resulted in the greatest success, since none have been attacked by this terrible disease, which generally decimates the foreign population shortly after their arrival. The operation is similar to vaccination, by inserting the virus discovered by Dr. Humboldt, generally in both arms. A few hours after this trifling operation, the symptoms of a miniature yellow fever commence, and all the pathological consequences follow rapidly and slightly, rarely exceeding forty-eight hours in duration, and with nothing more than a slight feverish action.

Pulling Down Telegraph Wires.

In some sections of the State of Mississippi, the people, it is reported, have pulled down a number of miles of telegraph wires, because some learned ignoramus had demonstrated to the people, that the long drouth in these regions was caused by these wires carrying off the lightning, which used to bring heavy rains.

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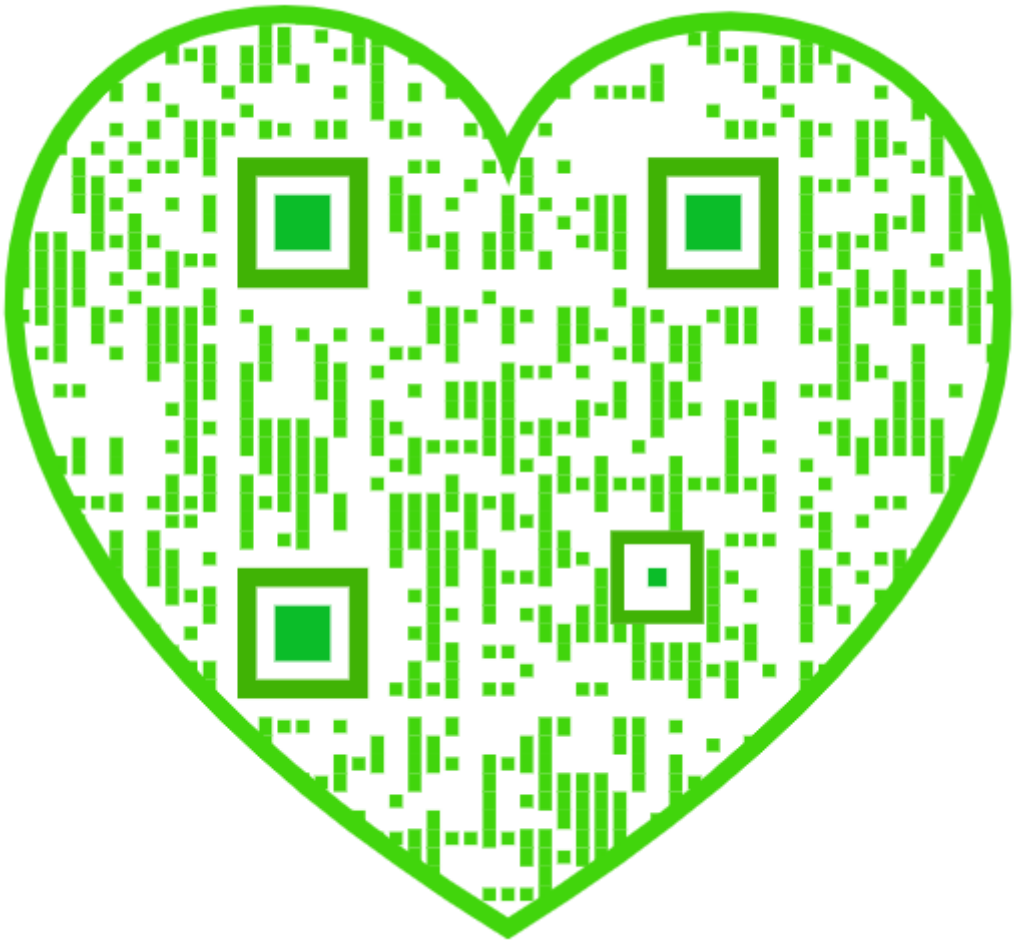

The Art of Dyeing—No. 14.

MADDER PURPLE ON COTTON—The only permanent purple dyed on cotton is with an iron mordant and madder dyewood. These colors, named *purple* by Turkey red dyers, are not of the same shade, however, as *spirit* purples. The name, therefore, is calculated to mislead a stranger to the art, whether he be a silk, woolen, or fancy cotton dyer. The madder purple, so understood, approaches more nearly a black, having a reddish tinge, like the beautiful ringlets of Diana of Poictiers. It is dyed by bleaching the goods, then giving them three or four saponaceous liquors, made of olive oil, *broken* in a soda lye. The strength of each liquor should be about 2° Twad. The goods are padded in this, and dried, after each operation. They are rinsed in milk warm, clean water, then run through an iron mordant, then well washed, and are fit for dyeing in the madder. The mordant is made by dissolving one pound of the sulphate of iron for every ten pounds of goods, then adding two ounces of dissolved acetate of lead, stirring all up well, and allowing the liquor to settle for an hour. The clear is then run off into another vessel, and in this the goods are padded in small bunches, or they may be handled on pins, which is by far the most workmanlike and speedy mode of accomplishing the object. About 25 pounds of yarn are dyed in one copper kettle at once. The madder, of equal weight with the goods, is placed in the kettle among the cold water, and the goods entered, the liquor is brought up to boil in three-fourths of an hour, continued at the boil for about the same time, then the goods lifted out, washed, squeezed, and dried.

According to the amount of iron given to the goods, so will the color be darker or lighter in the shade. The weaker the mordant, the lighter and more reddish in shade is the color.

Madder lilac is but a light purple shade, which is produced in the same way as the above, but with a weaker mordant, and less dye stuffs. Great care must be observed in handling the goods in the iron mordant, so as to prevent them from taking on the dyewood in streaks. Calico printers make every variety of beautiful purples and lilacs, with the same mordant, by using it at different strengths.

BEAUTIFUL REDDISH PURPLE SHADES.—A great variety of reddish purple shades can be produced by a mordant composed of alum and the sulphate of iron. One pound of alum, and one pound of the copperas (sulphate of iron) are dissolved together, and will answer for 20 lbs. of cotton goods. They are dissolved in warm water, and the clear liquor only used. The rest of the process is the same as that described for dark madder purple.

MADDER CHOCOLATE—This color is dyed by giving finished Turkey red goods two or three dips in a strong blue vat. It is a beautiful and rich color, but very expensive.

BARWOOD PURPLE—This color is generally called "brown," but it more properly belongs to the purple class. It is dyed by *saddening down* with the nitrate of iron, or the sulphate of iron, barwood reds, in the same boiler in which they are dyed with the barwood. The amount of iron given to sadden down must be in proportion to the depth of the shade desired, the darker this is the more iron is required. Two or three pailsful of old sumac liquor is generally added to the barwood liquor; it possesses the quality of an *evener*; that is, the goods are not so liable to be streaked with, than without it. For the method to dye barwood red, see article on page 138. The nitrate of iron makes a more rich and lively color, than the sulphate, it is therefore the best saddening substance.

DEEP PEACH-WOOD CRIMSON—A purple on the crimson shade may be dyed by the use of the alum and iron mordant, the goods having first been steeped in sumac liquor all night. The only difference between dyeing this color and a common peach-wood or Brazil-wood red, is simply in the mordant. It is wonderful what a variety of shades of purple may be produced by the modes we have described by simply varying the strength of the mordants.

ALUM PURPLE—The cheap purples dyed on coarse cotton, and carpet rags for rag carpet, is made by steeping the cotton or rags in a liquor of boiled sumac (about two pounds to the ten of cotton) for twelve hours, then in a strong solution of alum all night, after which they are washed and ready to get the dyewood, which is a strong logwood liquor, about six pounds to the ten of the goods.

Wool Spinning.

In our list of patent claims last week there were two granted to Frederick S. Stoddard, of Litchfield, Conn., for improvements in machinery for spinning wool. The invention is particularly applicable to the spinning of wool alone, or a mixture of cotton and wool; it may, however, be applied to other fibrous materials. The improvements embrace an arrangement of front drawing rollers, with new and superior counter-twist pulleys, and a means of governing the counter-twist whereby the roving is allowed to receive very little twist near the back drawing roller, where it is full sized, but an increasing twist as it approaches the front drawing rollers and is reduced by the drawing. In laying the thread after being spun, as the conical bobbin is being built up, equal tension is very far from being maintained on the thread, which is the cause of a want of uniformity in its twist. This evil is remedied by a friction drag placed upon the ring traveler, while the thread is being wound up in such a manner as produce a uniform tension on the thread during the whole process of building the bobbin. This tension is regulated by an adjustable screw in a lever, and the drag is produced by a series of brushes secured in a beam extending the whole length of the frame, and hinged, at proper intervals, to the back of the ring plate; one brush stands opposite each ring.

Grain Cleaner.

The patent granted last week to George Leach, of Owego, N. Y., for an improved machine for cleaning grain, embraces the furrowing of the rubbing stones in a peculiar manner; also a peculiar device for maintaining the parallelism of the stones. The face of the bed stone has four grooves cut in it, tangential with the spindle orifice, and they extend about half way between the spindle and the periphery. At the edge of the face of the stone there are four furrows slightly curved, that extend inward, nearly half way to the spindle. The runner stone has four furrows in its face, which also curve and extend from the edge about half way to the eye. Between these furrows are others which are curved from the edge to points near the eye, and from these points to the eye they are tangential with it (the eye.) This manner of furrowing the stones, it is asserted, is a good improvement.

Gun for Firing Chain Shot.

One patent was granted last week to Christopher Wolter, of Bridgeport, Conn., embracing five claims, for guns to fire chain shot, to which the attention of Lord Raglan was directed. The invention relates to the employment of two barrels, adjustable at different angles to one another, for the purpose of firing chain shot at various distances, to extend the chain between the two shot without the danger of breaking it. The firing of chain shot is not of recent date, neither is the use of two gun barrels set at different angles, each to receive a ball, and to have them connected together, but to accomplish this perfectly has hitherto been impracticable. For example, a chain shot fired out of a double cannon—with the barrels at a certain angle, to distend the chain—snaps the chain when the distance reached goes beyond the certain angle for which the barrels are set. This improved cannon embraces devices to regulate the angles of the barrels for any distance, so that the chain will not be distended beyond the base line of the angle when it reaches the object. It is intended to sweep down whole ranks—a perfect war mowing machine.

Improved Railroad Track.

C. M. Eakin, of West Philadelphia, Pa., obtained a patent last week, for an improvement in rails for city railroads. The grooves of the rails now commonly used for city railroads are very liable to become filled up with dirt, which sometimes throws the cars off the track. To remedy this Mr. E. fills the grooves with india rubber or some other elastic substance, which will yield to the flanges of the wheels as they pass over it, and then spring back to the level of the face of the rails, when the cars have passed over.

Improved Wrench.

The claim in our list of last week of a patent granted to Joseph Hyde, of this city, embraces a very clever and useful improvement in wrenches. The wrench is like others for turning square nuts, or bolts, having two jaws; it, however, has also a small tongue, in the under jaw, which lies flat with its face for square work, but when required for round work, by pressing upon a small spring with the thumb, this tongue starts out at an angle, and grips the round bolt firmly. The improvement renders the wrench perfectly adapted to screwing out or in nuts, and square and round bolts.

Car Ventilator.

The claims of V. P. Corbett, on another page, relates to a vertical ventilating and dust deflecting fan placed directly over the top of each window of a car, and set in an opening between the ceiling and window, and made to revolve by the resistance of air, when the car is rushing through it. Each fan is so set as to exhaust the impure air from the inside, and thus cause a current of pure air to rush in to supply its place.

Attaching Augers to Handles.

Among this week's list of claims, the one granted to Chas. W. Colton, of Shelburne Falls, Mass., embraces, placing a metal tube down the center of the auger handle, and having a taper hole made entirely through it, in which the shank of the auger is placed. A metal band is placed around the tube, and works loosely on it; the shank passes through slots in this band, the lower one being a little tapered, with edges fitting in grooves in the sides of the shank where the band is turned, by which means the auger is secured to the handle with ease, and it can be detached as conveniently, when desired.

Improved Pump.

Among the list of claims this week, on another page, is one granted to John P. Cowing, of Seneca Falls, for an improvement in pumps, the nature of which consists in making a common single acting lift pump serve, not only for the ordinary uses of a well pump, but also for a force pump, for throwing a constant stream of water to a great hight or distance, so that it can be employed as a fire engine, or for washing windows, carriages, &c.

Expedition to Central Africa.

The expedition which left England in June, 1854, under the direction of McGregor Laird, to ascend the river *Niger*, and penetrate by steam into the interior, has returned completely successful. Not a life was lost, and it penetrated further into Africa than any other European vessel. The party on board the *Pleiad* steamboat numbered 66; it was composed of Europeans and Africans, and some of the former had never been in Africa before. It is a most surprising thing that all maintained good health, for all African expeditions have hitherto resulted in the almost entire destruction of the parties by fever. The Europeans on board took quinine daily, made a free use of a solution of the chloride of zinc in the hold of the boat; and the spirits of all were kept up by music.—This successful expedition forms a new era in African exploration.

Wonderful Freak of a Snake.

A great number of our cotemporaries have published a most astonishing snake story from the Albany *Transcript*, respecting a mouse which had been swallowed sixteen times by a large snake in the State Geological Rooms in Albany, and as many times had eaten its way out of his snakeship's stomach. The last time (seventeenth) which the snake tried to swallow the mouse was too much, "the sudden twitch snapped the snake in twain," says the *Transcript*, but "it lived a week after." This is pretty good for a snake story.

Engraving by Electro Magnetism.

The London *Journal* of the "Society of Arts" gives the following description of a machine to engrave by the power of electro-magnetism:—

"This machine is somewhat on the principle of the well known carving machine. The drawing to be copied and the plate to be engraved are placed side by side, on the movable table or lip of the machine; a pointer or feeler is so connected, by means of a horizontal bar, with a graver, that when the bar is moved, the drawing to be copied passes under the feeler, and the plate to be engraved passes in a corresponding manner under the graver. It is obvious that in this condition of things, a continuous line would be cut on the plate, and, a lateral motion being given to the bed, a series of such lines would be cut parallel to and touching each other, the feeler of course passing in a corresponding manner over the drawing. If, then, a means could be devised for causing the graver to act only when the point of the feeler passes over a portion of the drawing, it is clear we should get a plate engraved line for line with the object to be copied. This is accomplished by placing the graver under the control of two electro magnets, acting alternately, the one to draw the graver from the plate, the other to press it down on it. The coil enveloping one of these magnets is in connection with the feeler, which is made of metal. The drawing is made on a metallic or conducting surface, with a rosined ink or some other non-conducting substance.—An electric current is then established, so that when the feeler rests on the metallic surface, it passes through the coils of the magnet, and causes it to lift the graver from the plate to be engraved. As soon as the feeler reaches the drawing, and passes over the non-conducting ink, the current of electricity is broken, and the magnet ceases to act, and by a self-acting mechanical arrangement, the current is at the same time diverted through the coils of the second magnet, which then acts powerfully and presses the graver down. This operation being repeated until the feeler has passed in parallel lines over the whole of the drawing, a plate is obtained, engraved to a uniform depth, with a fac-simile of the drawing. From this a type metal cast is taken, which, being a reverse in all respects of the engraved plate, is at once fitted for use as a block for surface printing. The machine is the invention of Mr. Wm. Hansen, of Gotha."

[We can easily appreciate how the above process is conducted. It is the same, exactly, as that employed in the copying telegraph of Bain and Bakewell. The reverse of the line that is to be engraved, is covered on the guide plate with some non-conducting surface, and a line is left open on the metal similar to the one to be engraved, so that this guide plate, with the design marked out with rosin, or wax ink, performs the same office as the key in the telegraph; it breaks and closes the circuit, and thus operates the magnets that control the engraving tool.

Treatment of Boots and Shoes when Burned.

In our juvenile days we had occasion, too often, to need a cure for carelessness in burning our boots, and we used to apply, with good effect, an application we have seen recently recommended in a late exchange. Apply, very liberally, and instantly, soft-soap to the burned leather, till it is perfectly saturated. If not too badly burned, the leather will be soft and pliable as before.—[Plow Loom Anvil.

Albany Stoves.

The Albany *Knickerbocker* states that more stoves are made in that city than any other in the world, and that the product of them this year, will amount to $2,000,000.

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A Wind Mill Operating a Propeller.

MESSRS. EDITORS—In the correspondent's column of last week's SCIENTIFIC AMERICAN I notice an answer to the communication I addressed to you in regard to running a vessel directly against the wind that propels it.

You seem to think it just as impossible as pumping water back by the wheel it drives, to keep using it all over and over again, but the two cases are not alike, as one would be perpetual motion, but the other is not. I am not a "perpetual-motionite," and am in no way "related" to that "tribe."

Water can be forced above its original head by the hydraulic ram, that is, part of its volume at the expense of the balance, and a vessel can be constructed to go directly against the wind that propels it by a sacrifice of speed. At first this may seem impossible, but no more so, I think, than a hydraulic ram would seem, throwing water higher than its original head, a well known fact.

Suppose a vessel to be constructed with a large wind wheel, whose shaft runs directly across the boat on a level with its deck, so that one-half its surface is below the boat's top (so as not to be acted upon by the wind.) Now suppose the wind blowing, at the rate of 12 miles per hour, and acting with a force of 1,000 lbs. against the bow of the boat, and the upper surface of the wheel (above its center) the surface of the wheel that is exposed to the wind, being equal to the boat's surface acted on this, leaves 500 lbs. force acting against each, but as the wheel yields to the wind, the wind would not really act with its full force to drive the vessel backward. But to favor you all we can, we will suppose that it does exert all of the 1,000 lbs. force as though the wheel was rigidly fixed. Then we have 1,000 lbs. force to drive the vessel backward at the rate of 12 miles per hour.

To counteract this we have a force of 500 lbs. operating against the surface of the wheel, which geared to a water wheel (at the stem of a boat) which is one-fourth the size of the wind wheel, or if both wheels are of the same size, then let them be geared in the proportion of four to one. Then the 500 lbs. force exerted against the wind wheel, will exert a force of 2,000 lbs. upon the other at one-fourth the speed, or at the rate of three miles per hour against the wind, with a force of 2,000 lbs., from which deduct the whole pressure of the wind against the boat (1,000 lbs.) which leaves it operating against the wind at the rate of three miles per hour, with a clear force of 1,000 lbs., but as the water wheel is acting upon a yielding medium, we will throw away one-half, to allow for slip, which leaves it moving against the wind at the rate of one and a-half miles per hour, with a force of 1,000 lbs., in spite of what you have said to the contrary, and by sinking the boat to nearly its deck it would do still better in point of force, as there would be still less surface of the boat for the action of the wind, and nearly its whole force would be expended to drive the vessel forward, instead of backward. As to the utility of such a vessel, that is another question, what might be gained in one way would be more than lost by its complicity, and the room it would occupy, so that it would be only a left-handed improvement after all. I only say that the thing can be done. A shaft with pinions on it, meshing into a rack, with water-wheels attached to the ends of the shaft, and longer than the pinions, will run up an inclined plane, with the water rushing down against the wheel; here is a body moving directly against the power that drives it, up hill and all; this experiment I tried years ago; are you convinced?

GEO. W. STEDMAN.

Vienna, N. J., March 14th, 1855.

[We have published the above letter—being the second we have received from Mr. S.—in order to answer it and some others, at once, for all. Mr. Stedman has presented an exceedingly simple way of proving that he is right, by demonstrating that he is wrong. He presents the example of a vessel having its wind wheel operated by a *wind force*, equal to 1,000 lbs. pressure on the vessel (and directly against it) and moving with a velocity of 12 miles per hour, the momentum of which is $12 \times 1{,}000 = m12{,}000$; and yet he moves the vessel against this at the rate of 3 miles per hour, with $2{,}000 \times 3 = m6{,}000$—only half the momentum. If he is not a believer in perpetual motion, he is unwittingly the strongest advocate of such a doctrine we ever knew. He has confounded two ideas, that of a vessel standing direct in the course of the wind with its machinery working at a certain velocity (3 miles per hour) and a certain pressure (2,000 lbs.,) for this vessel moving against the wind. In the very case he has presented, his vessel must drift directly before the wind at the rate of 6 miles per hour, instead of moving directly against it. We have seen a vessel with all its sails set and a fair wind, carried backwards by a rapid tide; his example is a similar case. The cases of the hydraulic ram, and the water wheel and rack (which is somewhat confused) are entirely foreign to the question, and any comparison to be correct must be appropriate. If we had said a stationary wind wheel on the side of a canal or river could not be made to propel a boat on the water directly against the wind, then his examples would have been appropriate. But this question is entirely different, and he does not seem to have discovered its abstract character.

Carriage Bolts, Rivets, Staples, &c.

"With bolts and rivets firm and strong,
Repairs the breach. The pliant thong
All needful aid supplies."—EDWARDS.

It is many times truly surprising to witness how totally ignorant, and unmindful many people are, of the advantages and facilities there are within their reach, to render them needed aid in a needful time. Many people, and particularly farmers, are placed in circumstances many times, when, if they were compelled to stop, but for a short time, it would be attended with many dimes, and even dollars, disadvantage and damage to them; and when some little article, of only a few cents value, might eventually save a vast amount of labor and expense. It is no uncommon occurrence to see farmers, who profess to be very economical in their expenses, paying four or five times as much for an article, or to have a broken implement repaired, as it need to cost him. The truth is, many farmers go blundering along through the world, with their eyes, as it were, completely closed against their own interest. There are scores of little articles within the reach of every farmer, which would often greatly facilitate his operations, and save dollars of needless expenses I will mention a few of them.

CARRIAGE BOLTS, from one inch and a half in length, to eight inches long, well made, with turned heads on one end, and a nut and screw on the other end, may be obtained at almost every store in the country, costing only from two to four and five cents each, and which are very convenient and handy, and exactly adapted to the innumerable uses of bolts, in repairing a broken implement, or in making new ones. Such bolts farmers must have, from some source, and often a large number of them; and when made by a blacksmith, they usually cost four or five times more, and often are not half as good. I know blacksmiths will endeavor to persuade their customers that the iron of such bolts is worthless. True, it is sometimes of rather a poor quality; but all things considered, they are better bolts than common blacksmiths will make; and in the majority of instances they are infinitely better than many of our country blacksmiths can make. Carriage bolts are made by machinery, straight, smooth, and true; about one half the length of the bolt is made square, and the other round, just as they should be, to prevent their turning around, when putting on the nut—with a thread cut on them, and not worn on, by worthless dies, and with nuts neatly fitted. Bolts that are made by common blacksmiths, are usually made of the poorest kind of round iron, with round heads, and the nuts often so imperfectly fitted, that they will hold just nothing, or so tightly, that they cannot be turned on, unless the heads are grasped in a vise, to hold them from turning round.

The next article is RIVETS, which may be obtained of almost any size and length, at twelve to fifteen cents per pound; and in one pound there are a goodly number. A common blacksmith wants from six to fifteen cents for one rivet; and many times they are often put in so carelessly, and ignorantly, that they are totally uselsss. The holes for them may be too large; and then the rivet is bent in the stick that it goes through; and although the cap and head may be on good, the rivet does not hug or draw the parts together as it should. There are many parts of implements that must be riveted that are often neglected on account of the cost; whereas, if they are bought by the pound, the expense is trifling.

Another very useful article is staples, which may also be had per pound. But before using them, they should be annealed, by putting them in the fire, when there are coals enough to heat them red-hot, and then allowing them to remain, until the fire has gone out. This process makes them very tough, and they will seldom break.

TIRE BOLTS, neatly made, with turned heads, and nuts well fitted, are often useful for many other purposes, besides fastening the tire on the wheels of wagons; they may be bought two inches and two and a half long, for one and two cents each.

WASHERS, of all sizes, may be obtained for twelve to fifteen cents per pound; and a common blacksmith wants six to ten cents for a single one.

Another very valuable article is cut wrought nails, for only five and six cents per pound; a blacksmith wants three cents each for them; and then, they are often such ill-shapen things, that they will split every thing, through which they may be driven, and are often brittle as glass. Cut wrought nails are of quite recent introduction; and where they cannot be obtained readily, common cut nails will bend, and the points will clinch about as well as wrought nails, if they are annealed by putting them in the fire (when the fire is going out,) and allowing them to become red-hot, and cool gradually. I have always practiced putting them in the stove at night, when the fire is renewed for the last time, and in the morning found them tough as annealed wire.

It is always best to purchase such articles by the pound, or by the dozen; we may rest assured that a few shillings can be invested no other way more economically, than in obtaining a supply of these little necessaries.

But when will one dispose of a dozen or two carriage bolts? I will tell when: in making a strong harrow, put in a carriage bolt, near every tooth, where there should be a rivet, and screw it up firmly. A few cents may thus save a dollar in expense. In making, or repairing a cultivator, or a scarifier, a dozen or so of bolts may be used very advantageously. A broken implement may often be mended, for the time, if a few bolts were at hand, and save the time and expense of going miles to the smith's shop. In making a hay rigging, or shelvings for either cart or wagon, they are just the article needed; far better than rivets, because when the timber shrinks they can be quickly tightened. There are numerous other little articles, which cost but little—which it is well to have always on hand. The best of implements will often break, or some part give way; and where a farmer is performing a piece of labor, when he can justly reckon his time at $5 to $8 per day—which is often the case—and is obliged to stop all hands and team for the want of a little five-penny article, wisdom would dictate, that all needful preparation should be made, before hand, for any such exigency.

S. EDWARDS TODD.

Lake Ridge, N. Y.

Muntz Metal for Ship Sheathing.

MESSRS. EDITORS—I read the article on the above named subject in the SCIENTIFIC AMERICAN of the 10th February, with much interest, and I thought that my mite of general information on the subject might be of some use.

It is well known to jewellers and others, that an alloy of gold and silver, when digested in nitric acid, has all its silver taken up by the acid; the gold being left retaining its former shape, but so weak that it can easily be crushed between the thumb and finger. A like action, in my opinion, takes place with the brass sheathing of ships, when exposed to salt water. The combination of any two metals which are fusible at different temperatures, such as copper and zinc, appears to be merely mechanical. When brass is heated to about the melting point of zinc, it crumbles to pieces very readily, and I think if it were subjected to great pressure at that temperature, the zinc could be squeezed out of the copper. L. F. M.

Le Roy, N. Y.

Food of the People of England.

In the days of Queen Elizabeth substantial diet was confined chiefly to persons of rank and wealth. A plowman was often compelled to dine on "water gruel." The food of the laborers was coarse and deficient; their clothing was incomparably more so, and their lodgings were rude, dirty and uncomfortable. The houses even of the wealthy were mostly destitute of glass windows and chimneys. The floors of the peasants houses were of clay, and filled with the accumulated filth of many years. The luxury of linen was confined to the rich and high-born. Their woolen cloth was all of domestic manufacture. Tea and coffee, and to a great extent, sugar, were unknown. Beer was the universal beverage. The higher classes of society lived chiefly on salted meats. The common people seldom ate meat in any form. The ordinary fare of working men, then, would produce a riot in a work-house now. Potatoes and turnips appeared about this time. In earlier ages, the people fed entirely on bread and meat. As late as 1750, out of a population of 6,000,000, in England and Wales, nearly one half were sustained by rye, barley, and oats. Now, the same class of persons are consumers of wheat. The use of the potato as the principal article of food has been confined to a few districts.

McCulloch remarks: "We are not of the number of those who regard the potato rot as a manifestation of divine wrath, and who suppose that its continuance will be ruinous to the poor. On the contrary, we do not hesitate to say, that, judging of its influence, in time to come by that which it has hitherto exercised, we should look upon the total extinction of the plant as a blessing, and not as an evil." The same author observes that the number of sheep and cattle consumed by the citizens of London, has not increased more rapidly than the population; but *the size of the animal is more than double.* In 1750, the average weight of cattle sold in Smithfield market, was 370 lbs.; of sheep, 28 lbs. Now, the average weight of beeves is about 800 lbs., and of sheep, 80 lbs.—Hence, every person consumes much more butcher's meat than during the last century. The entire amount of food consumed in England and Wales, in 1846, was estimated at £180,000,000 ($900,000,000,) making about £9 (45) to each inhabitant of 20,000,000.

Fish Breeding.

In a recent visit to the fish hatching establishment of M. Coste, in Paris, the French minister of agriculture, commerce, and public works, found there two hundred and fifty thousand newly hatched fish, one hundred and fifty thousand of which had only just been brought up from the establishment at Huniguen. All this large number were conveyed to Paris at the same time, and without a perceptible loss. The fish comprised common trout, trout from the lakes, salmon from the Rhine, and trout from the Swiss lakes.

Manufacturing in Lowell.

The Lawrence Manufacturing Company have contracted for the erection, during the coming season, in connection with the five mills now run by them, of the following brick buildings:—1 mill 52 feet by 86, 5 stories high; 1 picker-house, 52 by 101, 4 stories; 1 cotton-house 44 feet by 210; 1 cloth-room 34 feet by 115, 2 stories.

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New Inventions.

Shaving and FellyCutting Machine

The accompanying engravings represent an improved machine for cutting fellies, and also for shaving wood into fine slivers, &c., for which a patent was granted to S. R. Smith, and Elijah Cowles, of Amherst, Mass., on the 20th of February last. The improvements in this machine relate to the peculiar means employed for giving the necessary feed motion to the cutters; also the arrangement and construction of the cutter head and guide, by which the cutters are made to pass over the stuff to be cut.

Figure 1 is a plan or top view of the machine; figure 2 is a side view of the same, the nigh side of the frame being removed. Similar letters refer to like parts.

A represents the frame of the machine; B represents a vertical shaft at the back end of the frame, A, said shaft working in a suitable bearing, *a*. The lower end of the shaft, B, works in a step, *b*, attached to the upper part of a spring, C. This shaft has two pulleys, D E; D a working, and E is an idle pulley. The working one, D, is attached to a hollow shaft, F, which fits over the shaft, B, and is secured to it by a feather and groove, so as to allow the shaft, B, to rotate when the pulley, D, rotates, and at the same time allow the shaft, B, to be depressed, without depressing the pulley, D. The idle pulley, E, is merely fitted loosely on the hollow shaft, F. The lower part of the shaft, B, has a series of grooves or recesses, *c*, cut in it, and in these recesses a segment rack, G, gears, said rack being at the end of a lever, H, which has its fulcrum at *d*. To the outer end of the lever, H, there is attached a weight, I, and also a cord, *e*, passing over a pulley, *f*, at the upper part of the frame, A, and having its end secured to a clutch, *g*, which is on a small shaft, J, the bearings, *h h*, of which are attached to the back end of the frame. On the shaft, J, there is a worm wheel, K, which gears into a screw, L, on the hollow shaft, F, of the pulley, D; M is a lever having its fulcrum at *i*, one end of this lever is underneath the spring, C, and the opposite end is underneath slide N, attached to the front end of the frame. O is a lever having its fulcrum at *j*, one end of this lever (the outer end) passes through an upright arm, P, having an inclined or bevelled edge at one end, and the opposite end is fitted in a notch, or underneath a projection on a plate attached to the front end of the frame, A, directly above the slide, N. The outer end of the lever, O, is provided with a wire, *m*, having a loop in it through which a belt, *n*, passes, said belt passing around the working pulley, D, and also a driving pulley, R, at the front end of the frame, A. A′ is a spring which bears upon the lever, O; S is a slide through which the upright arm, P, passes. The inner end of this slide is attached to the clutch, *g*. T is a cap which is fitted on the upper end of the shaft, B, and secured thereon by a screw, *o*. This cap has a flat metal plate, *p*, secured to its upper surface, and the edges or sides of this plate are bent upwards, as shown in figure 2; *n* is a plate formed precisely similar to the plate, *p*, only inverted and placed directly over the plate, *p*. The two plates being secured together by bolts, *q*; V are rectangular bars which are fitted between the plates, *p*, and *u*, said bars having racks, *r*, cut in their sides, in which pinions, *s*, gear, said pinions being upon small upright shafts secured between the plates, *p* and *u*, the upper ends of the pinion shafts are provided with cranks, W; *x* is a sliding stock which works on the outer end of one of the bars, V, one stock only is shown, but in practice each bar is provided with one. The stock, *x*, near its outer end is provided with a cutter formed of a chisel slightly inclined from a horizontal position, and a series of cutting points, three or more, directly behind it. Near the inner end of the stock, *x*, there is an arm, *w*, which projects downwards, and has a slot, *x*, cut in its end. Y is a disk secured on the upper part of the frame, A, and having an upright rim or ledge, *y*, around it. This disk is of nearly, but not quite, circular form, one side being curved or bent, as shown at *z*, figure 1.—The rim or ledge, *y*, fits in the slot in the lower end of the arm, *w*, as shown in figure 2.

OPERATION—Motion being given the driving pulley, R, the pulley, D, is made to rotate, and also the shaft, B, with the bars, V V. Each bar, V, being provided with a stock, X, and cutter attached to it. The cutter, as the bars, V, rotate, passes in a right or straight line over the "stuff," which is placed on the upper part of the frame, A, and represented by *a′*. The cutters pass over the stuff in a straight line, owing to the irregular curved portion, *z*, of the rim or ledge, *y*, said portion, *z*, operating or moving the cutter stock, X, in consequence of the arm, *w*, fitting on or over the rim or ledge, *y*. The cutters as they pass over the stuff, cut thin narrow shavings, the chisel, *u*, cutting a broad shaving, and the small cutters dividing it into narrow ones. The cutters are fed down upon the stuff in the following manner:—As the hollow shaft, F, rotates, the screw, L, upon it communicates motion to the worm-wheel, K, and the small shaft, J, rotates, and the cord, *e*, is wound upon the one part of the clutch, *g*, the weighted end of the lever, H, is consequently raised, and the inner end depressed, and as the rack, G, gears into the recesses, *c*, the shaft B, is gradually depressed, and the cutters fed to the stuff. When the cutters have descended a distance equal to the thickness of the stuff, the spring, C, is depressed sufficiently to cause the inner end of the lever, M, to act upon the slide, N, and throw the inner end of the lever, O, out from underneath its catch, and the spring, A′, throws the inner end of the lever, O, upward, and the upright arm, P, in moving, throws the slide, S, in such manner as to separate or disconnect the clutch, *g*, and consequently the feed motion ceases, the shaft, B, and lever, H, returning to their original position, by means of the spring, C, and weight, I, the belt, *n*, by the downward movement of the lever, O, being thrown on the idle pulley, E. The cutters are then moved outward so as to take another cut by turning the cranks, W. The inner end of lever, O, is placed under its catch, and the operation above described is repeated. It is necessary that the cutters should pass in a straight line over the stuff in order that the shavings may be cut in the direction of the grain, and not transversely with it; in the latter case the shavings would be brittle and have no elasticity.

Messrs. Smith and Cowles have applied this machine to cutting out fellies, which gives great satisfaction, but as a shaving machine, to make fine shavings for upholstering and other purposes, it stands without a competitor.

More information may be obtained by letter addressed to the pateatees, at Amherst, Mass.

SHAVING, AND FELLY CUTTING MACHINE.

Fig. 1

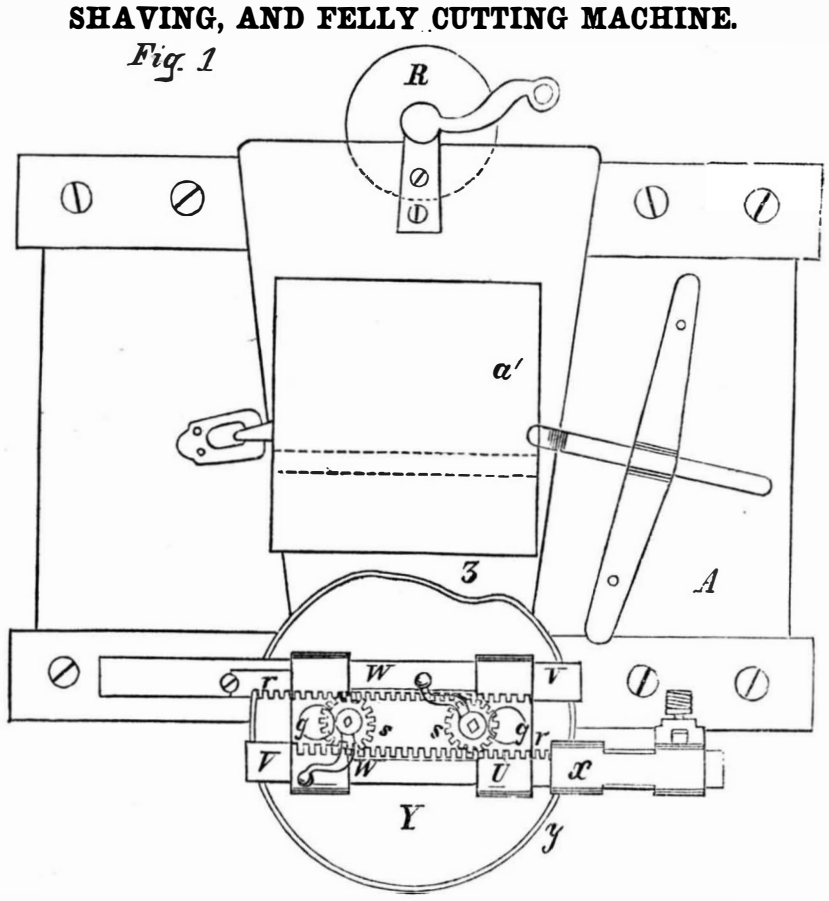
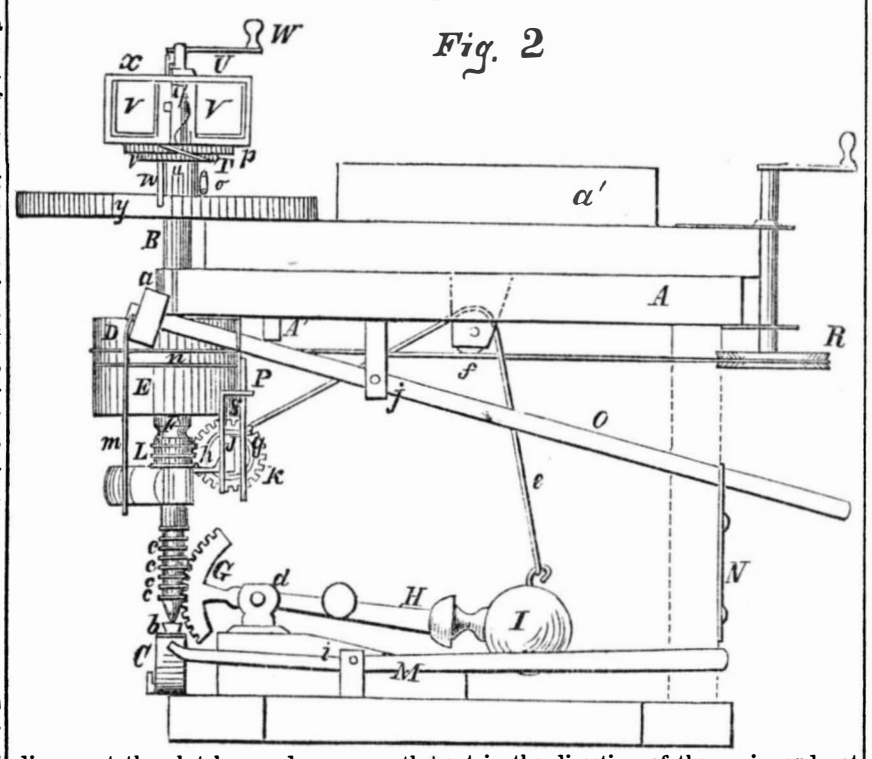


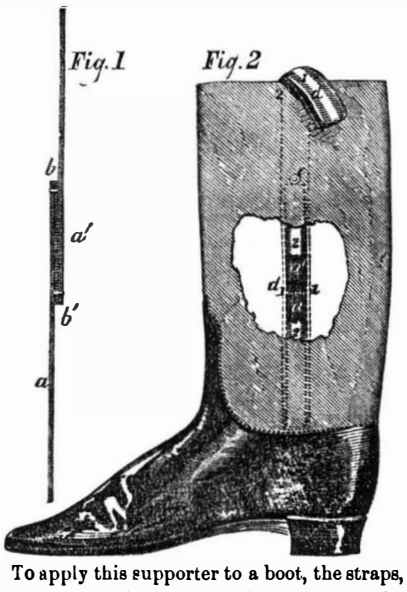
Fig. 2



Improved Support for Articles of Dress.

On the 13th of last month, John Dick, of this city, obtained a patent for an improvement in stays for articles of wearing apparrel, the claim of which was published on page 190.

Figure 1 is an edge view of the improved stay or supporter, and fig. 2 shows its application to the leg of a boot. This supporter is composed of two or more supporting pieces of whalebone, rattan, steel, or any other suitable material, with a spring applied to them in such a way as tends to keep them extended lengthwise. It is applied to such part of a garment (or article of dress, like fig. 2) as is liable to become wrinkled by the movements of the body, or otherwise, for the purpose of keeping such part in proper shape, and also bringing it back to proper shape when contracted by the motions of the body. The supporter represented is composed of two supporting pieces of whalebone, *a a′*, and one spring, *b*, composed of a strip of india rubber webbing. One end of the spring is connected by sewing or lacing to the upper end of *a*. This supporter is placed and secured in a garment in the same manner as whalebone strips in corsets, or on the waists of frocks, care being taken to have it well secured at the ends, and to have it a little contracted, so that the spring will have some tension upon it. By applying this supporter to the legs of boots, these can be made of canvas or woven cloth, which is much cheaper, and in some respects better than leather, but which, without being stayed or supported, is unfit to be so applied, as it will not stand up. Even leather boots fall down into wrinkles, and are greatly improved by this kind of staying to prevent creasing, and thus make pantaloons sit neat upon them.



To apply this supporter to a boot, the straps, *d*, are extended double all the way down the interior of the leg, and the supporter is placed between the inner part, 1, and the outer part, 2, of the strap, confining it at the ends and edges by stitching 1 and 2 together, or by eyelet fastening, *e*. These straps require to be secured to the boot at their lower end and near the top, by stitching, as shown by the dotted lines.

This useful improvement may be applied to all parts of ladies' dresses for which whalebone is now employed. It can also be applied to the bottom of the legs of pantaloons, to keep them in proper shape; indeed, it is applicable to a great many articles of dress.

More information may be obtained by letter or otherwise, of Mr. Dick, at 405 Broadway, this city.

Safety Ferry Bridge.

The invention for which a patent was granted, in our list of last week, to Henry Lawrence, of this city, is designed to prevent persons and vehicles passing over the edge of the floating bridge, after a boat has started, by which many lives are lost in this city every year. A gate is provided on the bridge, and hung in such a manner that when the boat comes in and strikes the bridge, the gate swings and opens to allow passengers and vehicles to pass into and out of the boat, but which, when the boat leaves, immediately closes automatically.

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Scientific American.

NEW YORK, MARCH 31, 1855.

Ice Ships.

When the surface of the earth is uncovered on Manhattan Island, but especially on Long Island, we behold innumerable loose rocks, of every size, from the small cobble of a few pounds to the large block of many tuns weight. Some of these are much water-worn, while others are rough and jagged.—They are also of great variety with regard to their composition. Some are of white granite, like that of the Sing Sing quarries, others like the dark grey granite of Staten Island; and others, again, are of the schistose class. These rocks grew not where they are found, and no human hands carried them thither. Whence came they, and how have they been deposited, far and wide, over such an extent of country, like huge hail stones dropped by successive showers? The only plausable theory for their presence is, that those places where they are now found, were once the bed of the sea, over which icebergs floated from an arctic ocean, with these stones attached to their sides and base, and were dissolved by warm currents of water, and thus relieved of their stony cargoes. In the northern seas, the ice forms to a great depth and grasps with its strong cold hand large and small rocks, at the sea bottom and on the shore. When spring comes, these are lifted up by the powerful thaw and water swell, and are floated off into the ocean, with their cargoes of rough stones wrenched from the rocky shore, and water worn boulders lifted from the sea bottom and beach. Carried out on the cold ocean currents setting from the north to the south, these icebergs at last disappear, by dissolution in the warm currents of the tropics, and, as a consequence, their rocky freights are strewn over the bottom of the sea. In the spring of 1838, a block of granite, estimated to weigh 1,000,000 pounds, is stated by Prof. Von Baer, of St. Petersburgh, to have been carried by ice from Finland to the Island of Hoagland; and it is well known that huge blocks of granite are carried down by the ice every season from Finland, and deposited along the bottom of Copenhagen Bay. This is the manner, no doubt, by which all Long Island, and much of the eastern coast of our continent came to be covered with boulders.

What powerful influences must have been at work, by which parts of our country now dry land, were once covered with the beating surges of ocean; then the wild waves repelled again, and the hills and valleys arising out of and above them. To conceive of a period in the history of our country when tall icebergs floated over the place where the city of New York now stands, seems to be a draft upon the imagination as heavy, as to believe in Aladdin's "Wonderful Lamp." But, if this "iceberg boulder theory" is correct, we must believe it; there is no other help for us.

Physical Geography of the Sea.

A new science, which has received the above name from Baron Humboldt, has come into existence within a very few years, and the credit of its authorship belongs to a Lieutenant of the American navy—M. F. Maury, L. L. D. The first distinct work on the subject, for public sale, has just been issued by Harper & Brothers, and we find that it is dedicated in a gentle spirit by Lieut. Maury to George Manning, of this city, who has done so much to disseminate information on the subject. The physical geography of the sea relates to its winds, currents, temperature, character of its waters, its depths and shoals. By charts, it presents the different tracks of vessels on the ocean, and then exhibits the winds and currents which they meet at different seasons of the year. These charts are made from the logs of numerous navigators, and have proved of immense benefit to the nautical world. Before the commencement of publishing these charts, the average passage from New York to California was 183 days; it is now reduced to 135 days. Between England and Australia, the average time of going, without these charts, was 124 days, and the coming about the same time. The outward passage is now reduced to 75 days. The saving to the United States trade with California and Australia, by shortening the voyages, amounts to more than $2,250,000 per annum. Nearly all the nations of the world are now unitedly engaged in advancing and perfecting this science.—A conference was held in Brussels in August, 1853, at the suggestion of the United States, consisting of representatives from France, England, Belgium, Russia, Sweden, Holland, Denmark, Portugal, and the United States, which recommended a plan of observations to be followed on board of vessels of all friendly nations. In peace and in war, these observations are to be carried on, and in case any of the vessels on board of which they are conducted may be captured, the logs of them are to be held sacred. "This," says Lieut. Maury, "is a sublime spectacle presented to the scientific world: all nations agreeing to unite and co-operate in carrying out one system of philosophic research, with regard to the sea. Though they may be enemies in all else, here they are friends. Every ship that navigates the high seas, with charts and blank abstract logs for observations, may henceforth be regarded as a floating temple of science." This eloquent passage must thrill the heart of every lover of science. It is greatly to be regretted that all these nations are not as friendly in the pursuit of national and commercial objects, as they are in the "science of the sea."

Although a great deal has been done in a few years, principally by American sailors, in collecting information for the preparation of the "wind and current charts," much yet remains to be accomplished. A vast amount of the great ocean spaces between Europe and the East Indies is almost unknown. In an outward voyage to India, the Atlantic has generally been crossed three times by navigators instead of only once, owing to one captain following in the route of another, so as to get such winds as were stated to prevail, for wafting their ships to the desired havens. Great activities are now at work to discover new and favorable routes, and thus make shorter voyages; these we have no doubt will be crowned with complete success.

Fencing Railways.

The State of Illinois is the first which has adopted measures to fence in all railroads, in order to prevent cattle straying on the track. This we recommended years ago. We hope every State in our Union will soon follow in the footsteps of Illinois. The law passed by the Legislatnre of that State provides that every railway now in operation, or which shall be hereafter placed in operation, shall erect and maintain good and sufficient fences on the sides of their roads, with openings and gates at the farm crossings, sufficient to prevent cattle from getting on the road.—And when such fences and guards are not erected and in good repair, the Company shall be liable for damages done by them to cattle which may get on the track, but if the fences and guards are erected and in good repair, they shall not be held liable unless the damage was wilfully done. Said fences need not be built through unoccupied lands lying at a greater distance than five miles from any settlement. Any person who shall lead, or ride, or drive any stock upon such road, except at the crossings, or tear down the fences or guard thereof, shall be liable to a fine of not more than $100, and for all damages sustained thereby.

Medicinal Effects of Saleratus.

A writer in the *Medical Examiner*, criticises the paper of Dr. Alcott, originally published in the Boston *Medical and Surgical Journal*, on the injurious effects of saleratus as used in domestic cookery, and especially in attributing the great mortality among children under five years of age in our country, to such use of it. No less than three-fifths of the deaths of children were attributed to its use, without any attempt to substantiate such a bold assertion by facts, excepting the placing of it among irritant poisons, because Orfila had done so. Common salt is also set down by Orfila as an irritant poison when excessively used. The critic in the *Examiner* tells Dr. Alcott that he forgot to mention that one-half of the children that die under five years of age never tasted bread nor saleratus. He asserts that "if the ill consequences resulting from careless cooking were properly estimated, it would be found that much disease might be traced to sour and badly fermented bread." Saleratus, he asserts, will produce no injurious effects from constant use in such small quantities as are required for making bread. How true these views make the old saying, "doctors do differ."

Patent Tea and Coffee Pot.

The annexed engraving is a side elevation, partly in section, representing an improvement in the construction of coffee pots, for which a patent was granted to James MacGregor, Jr., No. 117, Beekman street, this city, on the 11th of April last year.

The nature of the improvements, consists, first, in surrounding the bottom (or bottom and sides as far as may be desired,) of the tea or coffee pot, with an outer case, which may or may not be attached to the tea or coffee pot, leaving a space for water between the two cases, below the bottom of the tea pot, while the tea or coffee is being prepared,—there is no loss from evaporation, and the coffee or tea may be steeped somewhat longer to advantage than in the common mode.

Second, in having a mouth-piece to the outer case, for the purpose of pouring water between the two cases, and for the escape of steam made between the two cases; while the pot is on the heating apparatus this mouth-piece is always to be kept open. When it is removed from the heating apparatus, this mouth-piece may be covered to retain heat. The space between the cases should not be filled more than three-fourths full, thereby allowing free escape to the steam made between the two cases, and by that means preventing the water in the pot from rising much above boiling heat. The inner case or pot, where the tea or coffee is put, is generally made as much smaller below where the outer case is to join as is desired for water space. Thus leaving the outside of a uniform appearance. The handle is put on the side half way between the spout and mouth-piece, they being exactly opposite to each other.

Third, in having an air-tight cover to the spout and top of the pot, of sufficient weight and adhesion to cause pressure sufficient to prevent the tea or coffee from boiling while being drawn or prepared. The pot and all parts are generally made of tin.

A is a small ball valve in the spout; B is the cover of the pot; C is the space for tea or coffee. D is the space for water between the two cases. *e* is the mouth-piece attached to the outer case, for the admission of water, and the exit of steam by a channel, E.

DIRECTIONS FOR USING—Put the necessary amount of tea or coffee into the pot to make the desired quantity; then fill the pot with boiling water, sufficient to give the required amount, and carefully put the cover on; fill the space between the two cases (by pouring in at the mouth-piece at the handle,) two-thirds full. The cover to this mouth-piece is to be left open, while the pot is on the heating apparatus, or stove, to let the steam off, and to be closed when it is taken off, to retain the heat. The water between the two cases, while the pot is on the heating apparatus, should boil, but not vehemently. Tea will seldom require to have the water in the outer case boil more than ten minutes, and coffee fifteen to twenty minutes; then the pot can be taken off the heating apparatus; the cover on the mouth-piece should be closed and the pot left (if time is not pressing,) for tea about ten minutes, and for coffee about twenty minutes—more time does no harm. It may stand for hours without injury. The coffee roasted in the usual mode is ready for use without grinding, thereby preventing all sediment from the coffee. If the above time is taken, no loss is sustained by not grinding.

By the use of one of these pots, a much superior tea and coffee liquid is obtained than by common pots, and with less tea and coffee. This we have proved to our satisfaction; the improvement is a most excellent and economical one, and will effect a considerable saving in every family in which it is used.

These pots are manufactured and sold by Mr. MacGregor, at the above named place.

Railroad Signals.

The *Railroad Advocate*, in the above question, is like an eel that has tied itself into a knot so tight that it cannot get loose. It made a voluntary wrong statement, and it wriggles and wiggles in its own mud to hide it; but all won't do. In the last number, it flies for consolation to that reviler of everything. American—the London *Mechanic's Magazine*. It is welcome to such company; as distinguished for its profound ignorance, as it is for its vapid conceit.

The *Railroad Advocate* characterizes the *Mechanic's Magazine* as "one of the ablest and most respectable journals of the kind in the world," thus evincing its practical ignorance of that publication. This is only a chip under which it attempts to hide its own slender proportions; a mere attempt to throw dust into its readers' eyes.

To show the power and force of its English authority, it is only necessary to state, that after more than a generation of years (according to a statement recently published in the *Tribune*,) its stamped issue amounts to about three hundred copies. "Full many a flower is born to blush unseen."

The fact is, the *Mechanic's Magazine*, like the *Railroad Advocate*, is able and respectable only for its insignificance to do good or evil; all else is purely imaginary; and the affiliation between the two is appropriate and consoling.

Engravers Advancing.

Samuel Cousins, the distinguished London engraver, has been elected a full Royal Academician. He is the first engraver who has been admitted to such an honor. Bartolozi was elected, not as an engraver, but as a designer. There is a talk of admitting another engraver a full Royal Academician, making the number of academicians forty-two instead of forty; but certain schoolboy conditions will, it is said, have to be complied with, which the most eminent engravers are unwilling to fulfill.

Amendment of the Patent Laws.

An amendment was made by our late Congress, at the request of the Commissioner of Patents, providing for four new principal examiners, four assistant examiners, and the power to employ two other principal, and two assistant examiners, if required. This amendment to the patent law confirms regulations heretofore adopted by the Commissioner.

Coal Pit Explosion.

A severe explosion, by which 35 miners lost their lives, took place in the Midlothian Mine, near Richmond, Va., on Monday last week. It was caused by breaking into an old shaft which was filled with fire damp. There were fifty in the pit at the time; those not instantly killed it is supposed will not live, owing to severe injuries.

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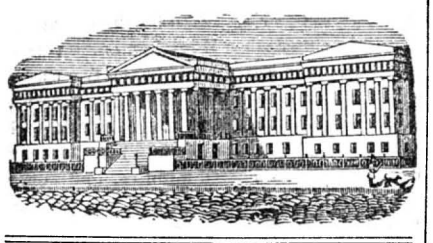

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING MARCH 21, 1855.

FOLDING LIFE BOATS—E. L. Berthon, of Fareham, Eng. Patented in England June 12, 1851: I claim hinging longitudinal ribs of the two sides to the stem and the stern post, in such manner that those ribs shall be capable of being folded down, and shall lie parallel with the keel when the boat is collapsed, as described.

SWIVEL FOR WATCH CHAINS—Elihu Bliss, of Newark, N. J.: I claim the specific arrangement of the joint of the swivel in the manner and for the purpose substantially as set forth.

WAGON BRAKE—J. E. Blodgett, of Hannibal, N. Y.: I do not claim the originating of the idea of wagon brakes, or their invention, claiming only certain improvements in the construction and application of wagon brakes, as described, rendering them perfectly effectual and applicable to all kinds of loading.

I claim the application of wagon brakes to the forward wheels of wagons by using the hounds, sway bar, block tongue, or other appendages running back from and firmly attached to the front axle, as the frame for the support and steadying of such brakes; also the construction of a brake so light and simple as to admit of being supported by such frame, such brake having a main bar of sufficient length to receive both pads, said main bar turning upon its fastening at or near its center with the pad for one wheel firmly attached to one end, and the pad for the other wheel so attached to the other end of the main bar as to turn on such attachment, or fastening such turning pad to be of such form as to bear against its wheel on being turned partly round, and to bear harder on being turned further, and at the same time by crowding back that end of the main bar to which it is attached, to throw the other end with its pad against the other wheel, as described.

KNOBS FOR FASTENING CURTAINS AND FOR OTHER LIKE PURPOSES—W. Z. W. & J. W. Chapman, of New York City: We claim the combination of the eyelet mentioned, or its equivalent, with a shank or knob of metal or other material that is covered, capped, encircled, or so connected with india rubber, or the equivalent thereof, that by its elastic nature the said eyelet may be secured to it as and for the purposes fully set forth.

SELF-VENTILATION FOR RAILROAD CARS—V. P. Corbett, of Corbettsville, N. Y.: I claim forming a series of ventilating holes, C C C C, in the sides of the car between the ceiling and windows, B B B B, and providing in said holes vertical ventilating fans, D D D D, which are arranged so as to be caused to revolve by the rapid moving of the car through the atmosphere, and thus made to exhaust the impure air from the inside of the car.

[A notice of this invention may be found on another page.]

DEVICE FOR AIR CHAMBER OF PUMPS—John B. Cowing, of Seneca Falls, N. Y.: I claim the combination and arrangement with the air chamber or vessel, F, of the pump, having its delivery spout or outlet below, or at or near the bottom of said chamber, substantially as shown and described, of a hand air valve or perforated nut, J, at or near the top of the air vessel, for the conversion by hand with facility and despatch, of the close air vessel into an open water reservoir, or vice versa, above the discharge outlet or spout of the pump, and whereby the uses of the common well or lift pump may be varied with despatch, and its conveniences augmented as set forth.

[See a description of this invention on another page of this paper.]

MACHINE FOR CUTTING BARREL HEADS—A. H. Crozier, of Oswego, N. Y.: I claim the described machine for cutting out and forming the heads of barrels and other similar articles, first, in arranging and operating two rotating cutters so as to cut scores in the opposite sides of the rotated heading at the same time, one cutter being arranged and operated so far in advance of the other that the latter cutter may cut so far into the heading and into the score made by the former without interfering with it (the first cutter) as to sever the superfluous portions of the heading from the head, at the same time that they cut it circular, and bevel or form the edge to fit the croze in the cask, substantially as described.

Second, traversing or vibrating the clamp edgewise, after the heading is placed in it to bring the heading in contact with the cutters, and to remove the head from the cutters after it is formed so as to take it out of the clamp and insert material to form another head, and bring it into contact with the cutters without stopping them (the cutters) during the operation or time occupied in making the change.

Third, the revolving clamp in combination with the rotating cutters, arranged and operated substantially as described and for the purposes set forth.

PUMP—C. G. Curtis, of Springfield, Mass.: I am aware that induction and eduction valve chambers and valves, with their case, have been arranged on the side of a horizontal pump barrel, midway between its two ends, the barrel being made to communicate with the valve case by two pipes leading from the said case respectively into the two ends of such barrel.

I am also aware that valves and their chambers have been placed at the lower end of a vertical pump barrel, and a leading pipe used to connect the valve case with the upper part of the pump barrel, the first of these arrangements only requires the removal of a cover plate to obtain access to the valves (such cover plate having no connection with or forming part of the cover plate of the end of the barrel,) while the second of these arrangements rendered it necessary to raise from the valve case the whole pump barrel and cap plate of the valve case, in order to obtain access to the valves. I therefore do not claim either of such arrangements, my invention having reference to an upright pump barrel.

I claim arranging the eduction and induction valve chambers concentrically around the upper end of the pump barrel, and with respect to one another, substantially as specified, they being provided with valves and passages connecting them together, and with the two ends of the pump barrel, as described, the said arrangement admitting one cap plate to be employed both for the valve cases and the pump barrel, and at the upper end of said pump barrel, as explained.

SHOT CARTRIDGE—Abbot R. Davis, of East Cambridge, Mass.: I am aware that a shot cartridge has been with a woven wire frame filled with shot and loose sand, and covered by paper pasted around it, I therefore do not claim such a mode of making a cartridge.

But I claim an improved shot cartridge made by mixing the shot in a plastic material or compound, of the character described subsequently reducing the mass to the shape required for the cartridge and covering its external surface with fibers of wool or other material, felted or appliedthereto, substantially as specified.

FEEDING FUEL TO FURNACES—Howard Delano, of Syracuse, N. Y.: I claim the combined use of the feed box and grate bars or cut-off for feeding in fuel into the under part of the burning mass, in the fire box, or their mechanical equivalents, as described.

I also claim the combination of the crank shaft, I, slotted piece, G, lever, F, and trigger, H, or their mechanical equivalents for sliding the feed box and grate or cut-off, and for raising and lowering the bottom of the feed box, substantially as described.

RAKES AND ELEVATORS—A. H. Gaston and Jos. Smith, of Sunbury, O.: We claim the endless belts, D D, rakes, L, in combination with the rollers, x, revolving forks, P P, for the purpose of raking and loading hay, as set forth.

BREECH-LOADING FIRE ARMS—A. T. Watson, of Castleton, N. Y.: I claim the mechanical combination and arrangement of the cylinder, G, the bent lever, H, and the forked standard, j' j', acted upon by the rod, J, and spiral spring, K, also the spring, i i, by which J, being drawn back, the cartridge constructed and arranged as described, is released from the pressure of I, and the cylinder is made to pass over the next succeeding cartridge, and the pressure of the finger being removed from J, the cartridge is firmly griped by l, and carried forward toward the chamber by the action of K and J, pushing before it also the next preceding cartridge ready to be deposited in the chamber upon the raising of the breech piece; which operation being repeated after each discharge in connection with raising the breech piece, secures a measured supply of charges from the magazine in the stock to the chamber to an extent, and with a facility not heretofore attained in breech-loading fire arms.

I claim also the forming of the breech piece of a segment of a circle, having the concave space, o, for the bottom of the chamber with its central point of depression in the line of the axis of the barrel.

I claim also the forming the lower end of the breech piece into two cutters, one front the other back, with the rounded swell between, operating as well to hold the cartridge in its place, as to cut off the end and remove the parts thus cut off, as described.

EXTENSION TABLES—Joel Haines, of West Middlebury, Ohio; I claim the construction and arrangement of the top so as to wind up in the case, substantially as described; it being understood that I do not claim in general the device of the chain of slats to wind up, as that has already been used in window blinds and shutters, but only the peculiar purposes for which it is applied to the table top, as set forth.

VALVE FOR HYDRAULIC RAM—Thomas Hanson, of New York City: I claim the mode substantially as specified, of forming the connection between the driving chambers and air vessel of water rams, the tube, and flexible cup placed within it, substantially as and for the purpose specified.

LAMPS—Elbridge Harris, of Boston, Mass.: I claim using within glass lamps of any form, reservoirs of metal which are provided with the usual tubes for burning common oils, or adapted by means of protectors to burn any fluid combustible.

I also claim the mode of ornamenting such reservoirs, contained within glass, by means of paper with metal or ornamental surfaces.

SHIP AUGERS, &c.—I. W. Hoagland, of Jersey City: N. J.: I do not claim making the cutting portion of the auger detached from the screw portion irrespective of the precise mode of attachment shown.

I claim attaching the cutting portion, B, of the auger to the screw portion, as shown and described, viz., by means of the dovetail notch formed by the shoulder, b, and inclined end, d, dowel, f, f, and screw, e.

[A description of this invention may be found on page 316, Vol. 9, SCI. AM.]

RAILROAD CAR BRAKES—Gideon Hotchkiss, of Windsor, N. Y.: I do not claim the mere application of the brake to the top of the wheels; nor do I intend to confine my claim to the application of the brake, by the means described, to the top of the wheel only, because by a slight modification and change, the principle and means claimed as original may be applied so as to press the brake to other parts of the wheel and accomplish or tend to accomplish the same object.

But I claim the method of operating a railroad car brake by obtaining the leverage from the axles and boxes by means of the bridges, keys, and clutches, or their equivalent, substantially as set forth.

I have described my improvements as applied to trucks for wide gauge roads having axles with inside bearings, but it will be obvious that they are applicable to trucks having axles with outside bearings, and also to cars without trucks, and I therefore claim my improvements when applied to axles with outside or inside bearings, and also to cars without trucks.

HAND PRESS FOR PRINTING—Chas. Keniston, of Boston, Mass.: I claim the arrangement and construction of the press described.

SEED PLANTERS—Ebenezer Morse, of Walpole, N. H.: I claim the scrapers, J J, the cam, n, and sliding back board, B, as arranged, combined, and operating conjointly with the seed box, A, for the purpose of depositing seed in hills, covering it with earth, and pressing the earth upon the seed.

Also the oscillating motion of the horizontal handle connected to the front and back part of the seed box by a hinge joint at each end of the handle, substantially in the manner described.

FIRE ARMS—Frederick Newbury, of Albany, N. Y.: I claim the ratchet plate with its ratchet indentations and its slot, in combination with the pin by which it connects with the cylinder. Also the two stop levers below the cylinder to regulate and secure the connection between the chambers of the cylinder and the barrel, substantially as set forth.

I claim the arrangement and combination of the tumbler with the hammer and cocking spring, to enable the hammer to act independently of the tumbler in the act of firing. Also the arrangement of the hammer to lie within the stock and to act in such line of direction upon the nippers as to press and hold the cylinder firmly against the barrel in the act of firing: the whole substantially as set forth.

I claim the arrangement of the apparatus for disengaging and attaching the barrel with the cylinder to the stock, viz., the thumb connecting plate or detent with the spring to hold it in place and the notch in the mandrel to receive the detent, substantially as set forth.

CARTRIDGES—A. N. Newton, of Richmond, Ind.: I claim the arrangement of the percussion priming with a metallic rod, in the manner specified, whereby said priming is ignited within the chamber of the gun between the ends of two metallic rods, as set forth.

SEED PLANTERS—D. H. Phillips, of Greenville, Ill.: I do not claim opening the seed delivering slide by a cog or projection on the carrying wheel or roller, striking against a lever to operate the slide; neither do I claim closing the seed slide after the roller has ceased to operate it by the action of the spring.

But I claim, first, the employment of a spring lever, f, to open and close the seed slide in such a manner that while it serves to open the slide by the direct action of the revolving wheel or roller, as specified, the same lever by its elasticity closes the slide after the discharge has been made, as set forth.

Second, providing both ends of the carrying and leveling roller which operates the seed slide lever with cogs or projections so arranged that by reversing the roller as described a slower or quicker movement is given to the delivering slide according to the description of grain to be planted.

MANUFACTURE OF BRICKS—L. E. Ransom, of Havana, O.: I make no claim to any portion of the processes of manufacturing bricks set forth in the French patents of Capgias & Chanon, June 21st, 1843, and Charles Henry Marigret, May 22, 1840.

But I claim the manufacture of bricks, substantially as described; that is to say by first spreading the tempered mortar or clay at once upon the ground where the bricks will be left to dry, and in beds of certain desired length, width, and thickness, and then while the mortar is in a soft state, or before it shall crack by too much drying, producing therein lines of weakening or separation defining the dimensions of the bricks, without regard to their smoothness or final finish, and after the bricks in drying shall have separated from each other along the lines thus formed turning them on edge, and squaring and polishing their edges, and defining the thickness of the same by rubbing over them the metallic tool, P, or otherwise, substantially as set forth; the desired thickness of the bed being produced by means of guide bars or molds and scraper or lute, substantially as specified, whereby I am enabled to dispense with off-bearers and otherwise to simplify the manufacture of bricks.

MOWING MACHINES—Fisk Russell, of Boston, Mass.: I claim arranging the secondary supporting wheel and the cutter frame in front of the driving shaft, when such driving shaft and the driving wheel are arranged and connected by gears as specified, the same serving to lessen the side draft or pressure on the horses or draft animals in comparison to what it would be, were the secondary wheel and the cutter frame disposed back of the driving shaft, when arranged with respect to the driving wheel, as specified.

I also claim the combination of two knives so that they shall project in opposite directions from one center plate or bar, in order that either of the knives may be used in connection with the guard teeth, and either be made to serve as a lever to the other whenever circumstances may require.

POLISHING DAGUERREOTYPE PLATES—David Shive, of Philadelphia, Pa.: I do not claim effecting a gyratory motion of the pad for polishing the surfaces of daguerreotype plates, or other like surfaces, by means of machinery, as such has been so effected before for similar purposes.

But I claim the shaft, E, with its arms, F, cranks, G, the pieces, C and D, or their equivalents, and the eccentric, H, with its spur wheel, I, in combination with the united spur wheels, M and N, and the spur wheel, K, when constructed and arranged substantially, and for the purposes as described.

SEED PLANTERS—B. M. Snell, of Hancock, Md.: I do not wish it to be considered that I claim novelty in the devices of my plow when considered separately.

But I claim the construction of a plow wherein a double share, D, is used to open the soil, in combination with a seeding tube, H, hopper, G, striker, a, wheel, K, operating in the manner set forth for the purpose of depositing seed in the prepared soil without the objection of an open furrow.

SELF-LOADING CART—J. A. Sprague and Bernard O'Connor, of Dayton, Ohio: We do not claim the combination of a large scoop or scraper, undivided, with the ordinary cart by suspension, in such a manner that the scoop or scraper may be raised or lowered by a windlass or lever, for this has been done before; neither do we claim dividing the scoop transversely near the middle, as such a device has been known and applied in dredging machines.

We claim, first, the combination of a large divided scoop constructed as described, with an ordinary cart in the manner and for the purpose substantially as specified and set forth.

Second, the angle irons, J, on the under side of the cart shafts near the forward ends, for the purpose specified and described.

MORTISING AND TENONING MACHINE—Elihu Street, of Montville, Conn.: I claim the improvement on a machine for mortising, tenoning, sawing, and smoothing by combining certain tools together, used by carpenters in the manufacture of doors, sash and blinds, as described.

VALVE GEARING FOR STEAM ENGINES—H. Uhry & H. A. Luttgens, of Paterson, N. J.: We do not desire to confine our claim to any precise manner of construction or application of the improvement, as from its capability of being applied to steam engines of different designs and purposes, its adaptation may, as already stated, call for modifications of parts connected to the improvement.

But we claim the differential rocker, G, operated substantially as described, in connection with the stationary or shifting link motion for the purposes of increasing the opening of the steam ports, at the higher grades of expansion, and retarding and varying the time of exhaust, without incurring early compression, attending increase of inside lap on an ordinary valve.

We also claim the duplicate valve seats, B'' and B', being arranged parallel to each other, provided with steam ports, f' e', i' g', and an exhaust port, h', the two steam ports, g' and e', towards the front of the cylinder, joining in one passage, J', lead the steam to that end of the cylinder; the other two steam ports, i' and f', leading the steam into one passage, K', towards the back end of the cylinder.

LOOMS—Lewis Van Riper, of Spring Valley, N. Y.: I claim, first, intertwining the warp threads in the manufacture of gauze fabrics by the employment of needles having a compound motion, substantially as described.

Second, constructing the needles for working the warps with flat or thin and crooked ends, substantially as described.

Third, the arrangement of the needles in two series and giving to one or both series a compound lateral and longitudinal motion, to intertwist the threads which the two carry, and at the same time open a shed for the insertion of the weft thread, substantially as described.

Fourth, the method described of working the needles so as to cause them to raise and lower, and intertwine the warps, alternately, with simply raising and lowering them to adapt them to weaving gauze and plain fabrics alternately.

Fifth, the combination of the needles and heddles operating automatically, substantially as described, so as to form a web of reticulated bars or strips of plain fabric with the spaces between the bars or strips filled with gauze.

Sixth, the combination of the yielding reed, 3, the lever, with the pin, 5, on its lower end, the pin, y, on the sword of the lay, the ratchet le[illegible]X, with its double inclined planes, x', for the pins to ac[illegible], and the ratchet wheel, W, with the cloth beam, fo[illegible]rpose of winding up the woven fabric at a variabl[illegible]bstantially as set forth.

Seventh, the co[illegible]n of the mechanism for winding up the woven cl[illegible]he cam, U, and the intermediate devices for the [illegible]f effecting the requisite changes in the variable c[illegible]

Eighth, the [illegible] cam, T, for the purpose of changing the operation [illegible]needles, as set forth, to adapt them to weaving pla[illegible]nd-gauze fabric, alternately set forth.

PUMPS—Wm. T. Vose, of Newtonville, Mass.: What I claim consists in connecting the two pump barrels at two adjacent ends, as described, in combination with not only arranging the valves of their respective pistons, so that one of them shall be applied to one or the upper side of one piston, while the other is applied to the opposite or lower side of the other piston, as stated, but applying the eduction and induction pipes, respectively to the disconnected ends of the barrels, substantially as specified.

PRINTING PRESS—L. T. Wells, of Cincinnati, Ohio: I claim the platen, U, hinged or pivoted to vibrating arms, V, in combination with the stationary pin or pins, n, and retracting springs, X, or equivalent devices for the purposes explained.

CENTRIFUGAL WATER WHEEL—O. Willis, of Dizardville, N. C.: I do not claim a curved bucket; nor do I claim beveling the nut and rim individually; nor do I claim them when combined in such a form as to facilitate the escape of the water only, as this has been done by Fontaine Jouval and others previously.

But I claim, first, the peculiar double curved buckets in combination with the beveled rim and hub, or nut, in the manner and for the purposes set forth.

Second, I also claim ranging the top of the bucket on a line tangential to a circle of suitable diameter described around the center, its inner being in advance of the radial line, substantially as and for the purposes specified.

Third, I also claim forming the annular water space on the upper side of the wheel, substantially as and for the purposes specified.

GRAIN AND GRASS HARVESTERS—W. A. Wood, of Hoosick Falls, N. Y.: I am aware that a conical track clearer separate and independent of the bearing wheel has been used in mowing machines; this I do not claim.

But I claim making the inner face of the supporting wheel conical, for the purpose of clearing the track for the next or return swath of the machine, as described.

I do not claim a reserved space in general on the platform between the end of the cutting point and the frame.

But I claim the forming of a quadrangular space on the platform between the end of the cutting point and the frame of the machine sufficient to hold as much grain as will make a bundle or sheaf, before it is raked from the machine, as described.

CULTIVATORS—G. W. N. Yost, of Port Gibson, Miss.: I am aware that cultivators and scrapers have been used which were laterally and perpendicularly adjustable, therefore I do not claim such devices.

But I claim the combination of the adjustable scraper, E, with the bar point, &c., D, as described, for the purpose of baring off the row and rapping up the middle, also for scraping off the row, and rolling the scrapings over into the furrow opened by the plow, substantially as set forth.

ARRANGEMENT OF WHEELS AXLES, AND FRICTION ROLLERS—G. A. Prentiss, of Cheshire County, N. H.: I claim the combination, substantially in the manner described, of the following elements, viz., a load axle with a bearer secured thereto, a securing axle concentric therewith or nearly so, and a ring or series of friction rollers, the whole being applied to a pair of wheels, substantially in the manner and for the purposes specified.

SEWING MACHINES—Geo. W. Stedman, of Vienna, N. J.: I claim feeding the cloth along by means of the needle acting as a lever against it over a fulcrum, t, the needle carrier being driven for the purpose with a crank motion or its equivalent, substantially as set forth.

In connection with the above motion of the needle, I also claim regulating the length of stitch by the combined action of the slot, l, of adjustable length, and the slight spring, j, or its equivalent, for throwing the needle away from the fulcrum when disengaged from the cloth, substantially as described.

I also claim the construction of the finger, M, with a thin pointed beak, m, for entering the loop, with a wedge-shaped shoulder, n, for spreading the loop open to receive the needle in turn, and with a spring, p, for retarding the motion of the loop, arranged and operating in combination with the needle, substantially in the manner and for the purposes set forth.

PRESS FOR MAKING CYLINDRO-CONICAL HOLLOW PROJECTILES BY PRESSURE—W. M. B. Hartley, of New York City: I do not claim the manner of operating the die sections.

But I do claim the collar, R, in combination with the sectional parts of the die, constructed, arranged, and operating substantially as and for the purposes set forth.

I also claim the arrangement relative to the punches, P P', of the die, A, with a horizontal motion of sufficient amplitude to admit of the successive action of the punches, substantially as and for the purposes set forth.

I further claim capping the ball while in its die, and while held firmly at its base, by a punch, which, on the opening of the sections, will, by a subsequent or continuous motion discharge the ball, capped and ready for use.

ATTACHING AUGERS TO HANDLES—C. W. Cotton, of Shelburne Falls, Mass.: I claim attaching or securing augers to handles by having a metallic tube, B, placed around the center of the handle, and having a transverse rectangular taper hole, a, made through the handle and tube, and a metallic band, C, placed around the tube, B, and turning loosely thereon, said band having slots, c d, made through it, a part of the slot, d, being of taper form. The shank of the auger being placed in the hole, a, and through the slots, c d, in the band and secured in the handle by turning said band and causing the edges of the taper portion of the slot, d, to pass in the notches or recesses, f f, in the shank, as shown and described.

[A brief description of this invention may be found on another page.]

ORE SEPARATORS—Reuben Shaler, of Madison, Conn.: I disclaim the use of the screen, m, except when used in combination with the two sets of shelves, 3, 3, and the blower, a, which produces two blasts of unequal force. I disclaim also the use of two sets of shelves when used in combination with a blower of common construction.

I claim the described combination of mechanism which separates the fine earth and small particles of gold from the coarse, and exposes the finer portion of impurities and gold to a moderate blast, and the coarser portion to a more powerful blast. The said combination embraces the blower, a, which produces two blasts of unequal force, the two sets of shelves or inclined planes, 3 3, and the screen, m, or its equivalent. This combination I claim when the several parts are used substantially as specified.

SEWING MACHINES—T. J. W. Robertson of N. Y. City: I do not claim in itself as new, the arrangement of the feeding dog and spring clamp separately operating upon the cloth on its one or outside surface, as such has before been done by the alternate action of these devices.

Neither do I claim of itself a separate and constant spring pressure applied to the outside surface of the cloth when the feeding bar or dog is otherwise arranged to operate in connection with the spring clamp, or hold, as specified.

But I claim the combination of the spring clamp, D, with the feeding bar or dog, f, constructed, arranged, and operating together against the cloth on its one side or surface, substantially as set forth.

CASTERS FOR FURNITURE—G. L. Bailey (assignor to G. L. Bailey and Mighill Nutting,) of Portland, Me.: I claim the pin, B, or oval guide put through or applied to the spindle, A, in any manner, or its equivalent, and attached to a straight truck frame, G, with a socket hole, E, larger than the spindle, A, in the manner and for the purpose substantially as described.

DESIGNS.

TABLE FORKS—J. W. Gardner, of Shelburne Falls, Mass.

COOKING STOVES—Jacob Beesley and Edward J. Delany, of Philadelphia, Pa.

French Railways.

The number of main lines of railroad in France, independent of branch lines and prolongations, is set down at sixteen, and as giving on the 31st of December last a total length of 1169 French leagues. Of this distance the four great lines of Orleans, Strasbourg, Lyons, and the North, comprise of themselves three fourths. The total receipts of these sixteen main lines amounted for the past year to 196,534,813 francs, showing an increase of about thirty millions of francs over the receipts of the previous year, which latter had also exhibited about the same progressive movement over 1852. The report is defective, however, in one principal ingredient in such documents, inasmuch as it fails in giving the nature of the traffic—the number of travelers and weight of goods, that is, which has produced the above results.

Size of London.

London extends over an area of 78,029 acres or 122 square miles, and the number of its inhabitants, rapidly increasing, was some 2,362,239 on the day of the last census. A conception of this vast mass of people may be formed by the fact that, if the metropolis were surrounded by a wall, having a north gate, a south gate, an east gate, and a west gate, and each of the four gates was of sufficient width to allow a column of persons to pass out freely four abreast, and a peremptory necessity required the immediate evacuation of the city, it could not be accomplished under four-and-twenty hours, by the expiration of which time the head of each of the four columns would have advanced a no less distance than seventy-five miles from their respective gates, all the people being in close file, four deep.

A New Boiler.

A new form of boiler has recently been tried in its application to locomotives, in England, with great economy in fuel, and time—it is said—in getting up steam. The improvement consists in piercing the sides and top of the fire-box, and the crown plate of the boiler flue, with a number of holes about three inches diameter, into each of which, projecting into the water space, is rivetted a malleable cast iron cup, from four to six inches deep, those on the sides being cylindrical, while those on the crown plate are spherical. These cups are, of course, covered in every direction by the water in the boiler, and the inside being exposed to the heat of the fire and concentrating the temperature, present so much additional heating surface, that the boiler is enabled to get up steam in a vast deal less time, with a diminished quantity of fuel. Several stationary horizontal boilers of this description, have been in use in London for the past twelve months with success, which, being worked by gas coke, have avoided the smoke nuisance.

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TO CORRESPONDENTS.

S. S. L., of Ky.—We think the tree you refer to must be the East Indian palm or toddy tree. The liquor is obtained by cutting off the leaves of the branches, and collecting the juice in suitable vessels, as it exudes from the wound. To the owner of a plantation the most valuable part of the palm tree is the toddy. At sunset, a man of the Bundarree caste of Hindoos mounts the tree with two or three earthern pots, called "chatty," capable of containing about a gallon each, tied to his waist, and a large knife, shaped like a sickle, in his hand. He is assisted in his mounting by two circular pieces of rope, large enough to extend round (when doubled) two-thirds of the circumference of the tree, one of them being attached to his hand, and the other to his feet, by which means he ascends the tree without the assistance of his knees. Some of these trees are about 100 feet in hight; and one man has twice daily to ascend and descend fome fourteen or fifteen, or even more of them. He cuts off one of the leaves of the tree when the stalk is about two inches in diameter, and ties on one of these chatty pots. If the leaf has before been cut off for the extraction of the toddy, he only removes half an inch from the end of the stalk, whence the toddy again exudes. After having thus fixed his pots, sometimes three or four on one tree, he descends the tree, and mounts as many more as may be necessary.—In the morning, at daybreak, he returns to the trees, takes down the pots, which are half full of liquor, and places others in their stead. This liquor, which, when fresh from the tree, is called "neera," is as transparent as water, and of a pleasant, sweet taste; but immediately the sun rises it begins to ferment, after which it becomes of a milky color, tart, and sourish—it is then termed "taree," whence our corruption, toddy. The fermentation is soon at its hight, and in that state it is used by bakers as a substitute for yeast to raise the dough. A great deal of the taree is drank by natives, and is of an intoxicating quality; but by far the greater portion is made into vinegar, or distilled into arrack. So says the work from which the above is extracted.

T. C. N., of Ga.—Sutton & Co., of Kensington, Philadelphia, manufacture Parker's wheel. The first patent has expired. Mr. Sutton will give you all the necessary information; so will J. Sloan of Sloansville, Ky.

M. N F., of Baltimore—We are not acquainted with any work respecting the construction of toothed wheels, as sought by you.

G. D. J., of Vt.—Powder has oftentimes been proposed as a substitute for steam; it cannot be so used, either with the safety or economy of steam. Give your attention to some more feasible project.

D. R., of N. C.—Apply to T. P. Shaffner, Esq., Washington, D. C., and he will give you the necessary information about the cost of 100 miles of telegraph line.

L. F. M., of N. Y.—We have been given to understand that no substance will answer for a good preservative in safes, unless it contains a great deal of water: plaster of Paris retains this to a greater degree than almost anything else. Hot steam will char wood; what colored the gold we cannot tell.

D. T. S., of N. Y.—Both your plans are old; the press is in common use; it is Hoe's patent—print's the fastest of any in the world.

S. M., of Ind.—We discover nothing patentable in your mole trap.

J. R. P., of Ohio—Almost every watchmaker possesses the requisite instrument for cutting brass wheels such as you describe. You can have them made in your city.

A. J. B., of Mass.—The most economical method of obtaining a noon-mark for those who live in the mountains, is a compass.

A. L., of Pa.—$3 received; all right: we think there would be little use in prosecuting your case further.

C. C. A.—The residence of Mr. Junius Judson is at Syracuse, N. Y.. we believe.

H. L. C., of Mass.—We do not remember the brick machine you speak of.

L. R., of C. W.—We don't know where you can find the filtering matter.

J. L. J., of Pa.—Write to Mr. Mace; he will give you all the information. $2 received; all right.

C. T. M., of S. C.—Exhausting the air from within a case would make little difference in the temperature. $1 received.

A. F., of Mass.—We are not acquainted with the gentleman you name.

A. P., of N. J.—A cylinder revolved by a crank forroasting coffee, placed in the stove oven, contains no feature of a patentable character.

L. M. H.. of Mich.—Your alleged improvement in rotary steam engines, appears to possess no novelty of a patentable character, therefore we cannot advise you to make an application for it.

H. B. N., of Pa.—Charcoal dust and plaster of Paris mixed together, are the best substances for preserving night soil, and converting it into a portable fertilizer. These two substances will absorb the ammonia, and remove the offensive odor. Apply in quantities sufficient to do this. Charcoal dust alone is very good for the purpose.

S. B. W., of Ohio—In Ohio tin roofs may last for a great number of years without painting, but not in this latitude, because the sea breezes soon rust it. The best paint is red lead, put on when the roof is about two months on. Give a thin coat first; let it dry, and then give a second thicker coat.

S. S., of Ill.—The truth is there is not a real good work on architecture of the kind you want. Anderson's Villa Architecture, by G. P. Putnam, this city, is a good work, but is as high as $18.

G. H., of——There is nothing new or patentable in your way of making cut nails.

S. N., of Ind.—You do not seem to have considered the question in a proper manner. You say, "If it were necessary that the principal part of the surface on which the wind acted should move against the wind, then, indeed, would the problem be impossible." Well, sir, it must be so, for if the vessel is moved against the wind, is not the surface against which the wind acts moved against it.

R. S. N., of Troy—Excepting in the method of reversing your paddles, all the rest of the plan is old. They may answer a good purpose for canal propelling, but is a center wheel not as good.

R. W., of Cincinnati—The best plan for you to pursue is to correspond with Mr. D. W. yourself.

F. Z., & Co., of Ill.—The plumb and level indicator described by you does not possess any patentable novelty. In Vol. 1, SCIENTIFIC AMERICAN, you can find an engraving of one substantially like it. There is no chance for a patent on it.

A. G. G, of La.—Your valve might do very well; the difficulty, however, is not in the valve, but in the governor A common governor will not operate unless its spindle remains always vertical.

F. G. W., of Mass.—The "Archimedian Plow," invented in England, consists of a roller armed with teeth or spikes for tearing up the soil. We have not much opinion of it utility, except when used in light soils. It would have no effect upon tough prairie sward.

H. A. S., of Vt.—The shell which you describe appears to be new, but we cannot say how far it would exceed those in present use. Its effectiveness can only be determined by experiment.

J. C., of Tenn.—Yours has been received.

E. L., of——Yours will appear next week.

M. P., of——Yours will be answered next week. You do not seem to be aware that we pointed out the errors of Prof. A. two years ago.

G. W. S., of N. H.—We have entered your name for one year's subscription, as we have no back numbers to send you containing the pumps mentioned.

S. M. L., of Ohio—We are much obliged for your very good opinion of our paper. Such a straw cutter as you describe contains no new feature. We have seen them constructed in the same manner.

J. R., of Mich.—We do not think there is the slightest chance for a patent on your rotary engine. In its general features it is similar to many others which have been sent us from time to time. It could not in our opinion be made to operate with any degree of satisfaction.

A. R., of Ind.—Congress redeemed its character from many supposed sins by rejecting "Colt's Patent Extension Bill," that abominable patent bill, and one or two other acts of less magnitude. We therefore conclude that all attempts to procure an extension of the Woodworth Patent will prove abortive. No action was taken upon it, and we presume that its owners will have sense enough not to press it again.

Money received at the SCIENTIFIC AMERICAN on account of Patent Office business for the week ending Saturday, March 24:—

G. A. M., of N. Y., $55; I. F. W., of N. Y., $30; S. G. P., of Mass., $20; M. T. K., of Pa., $70; G. A. B., of Ill., $55; A. S., of Pa., $30; U. H., of Ct., $30; D. & J. R. P., of Pa., $25; H. S., of N. Y., $30; T. S., of N. J., $30; H. A. R., of N. Y., $30; J. W. T., of Tenn., $25; R. J. M., of N. Y., $80; O. W. S., of Ct., $55; W. G., of N. J., $25; R. D., of Pa., $15; J. T., of N. Y., $25; L. S. E, of N. Y., $30; D. L. B., of Miss., $35; H. B., of Ct., $100; E. G. H., of N. J., $30; W. D., of N. Y., $30; S. H., of N. Y., $30; J. S., of O., $30; E. P. M., of Mass., $25; S. S. T., of Pa., $20; G. R., of Mass., $30; J. S., of N. Y., $30; C. & D., of Va., $25; H. T., of O., $20; J. W., of Ga., $50; D. A. H., of N. Y., $25; C. & L., of O., $25; J. M., Jr., N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 24:

M. T. K., of Pa., (2 cases); S. G. P., of Mass.; A. W. F., of Pa.; W. G., of N. J.; D. & J. R. P., of Pa.; W. H., of Pa.; R. J. M., of N. Y., (2 cases); J. W. T., of Tenn.; E. P. M., of Mass.; J. T., of N. Y.; H. T., of O.; C. & L., of Ohio; C. & D., of Va.; C. R., of O.; J. M. Jr., of N. Y.; R. D., of Pa.; W. D., of Pa.

Important Items.

PATENT LAWS, AND GUIDE TO INVENTORS—Congress having adjourned without enacting any new laws pertaining to applications for patents, we have issued a new edition of the old laws, which may be had at our counter or sent by mail. This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12½ cents per copy.

BACK NUMBERS AND VOLUMES—We have the following numbers and volumes of the SCIENTIFIC AMERICAN, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75. Of Vol. 10, all the back numbers, at the subscription price.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

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IMPORTANT TO INVENTORS—MESSRS. MUNN & CO., 128 Fulton street, New York, Publishers and Proprietors of the SCIENTIFIC AMERICAN, having for many years been extensively engaged in procuring Letters Patents for new mechanical and chemical inventions, offer their services upon the most reasonable terms. Patents promptly secured in the United States, Great Britain, France, Belgium, Holland, Austria, Russia, Spain, and in all countries where they are granted. All business entrusted to their charge is strictly confidential. Private consultations respecting the patentability of inventions are held free of charge, with inventors, at their office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country. Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patsent present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence. Parties intrusting their business in our hands can rely upon prompt and faithful attention.—Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

The offices of Messrs. Munn & Co.'s American and Foreign Patent Agency are at 128 Fulton Street, New York; London, No. 32 Essex st., Strand; Paris, No. 29 Boulevard St. Martin; Brussels, No. 6 Rue D'Or.

UNITED STATES PATENT OFFICE,
Washington, March 8, 1855.

ON THE PETITION of James Brett, of Matteawan, New York, praying for the extension of a patent granted to him on the 10th July, 1841, for an improvement Key Wrenches, for seven years from the expiration of said patent, which takes place on the 10th day of July, 1855—

It is ordered that the said petition be heard at the Patent Office, on Monday, the 25th of June next, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 15th of June: depositions, and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia, Pa.; Scientific American, New York, and Post, Boston, Mass., once a week for three successive weeks previous to the 25th day of June next, the day of hearing.

CHARLES MASON,
Commissioner of Patents.

P. S.—Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 29 3

OPTICAL, MATHEMATICAL, Mathematical, and Philosophical Instruments.—Our Pamphlet Catalogue, with prices affixed, containing numerous well executed illustrations is furnished gratis on application, and sent by mail, free of charge, to all parts of the United States and Canada.
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1855—D. W. WHITING, Forwarding and Commission Merchant, Buffalo, N. Y.—Particular attention given to manufacturers' goods and wares, and shipped at the lowest rates by any line, as directed. Mark plainly, "care D. W. WHITING, Buffalo, N. Y." 29tf

TWO HOT AIR FURNACE MANUFACTURERS—The Committee of the Mechanics Institute, Montreal, will receive tenders for the construction of a furnace for warming the new Mechanes' Hall in that place. The dimensions are 80 feet long by 60 feet wide, and two stories, thirty-four feet in hight. The person who may be selected will be required to guarantee the efficient working of his apparatus. Address HENRY LYMAN, Montreal, C E. 26 4*

IMPROVED MACHINE FOR STUFFING COLLARS—Patented March 6, 1855.—WM. L. WHITTAKER, Cumberland, Maryland, Patentee. This machine is superior to all others ever invented for the purpose. It stuffs a collar from both ends at the same time, and uses both long and short straw, doing quicker and better work than can be done by hand. For particulars address the patentee, post-paid, as above. 1*

SHIP'S BLOCKS—Platt's Patent, May 18, 1852, a much admired and durable block. For sale by C. H. Platt, 46 West st., New York City. 29 4*

STEAM ENGINES—1 Horizontal, 15x36 inch cylinders; 2 ditto 12x36; 1 ditto 9x30, made by the Matteawan Co., in their superior manner, for sale at Beardsley's carriage shop, 76 Thirty-seventh st., N. Y., or A. S. ACKERMAN, Matteawan, N. Y. 29 2*

JAMES O. MORSE & CO., 79 John street, New York, dealers in all descriptions of pipes for steam, gas, and water, and manufacturers of every variety of fittings for the same, together with improved valves, cocks, oil cups, whistles, &c., steam pumps, gauges, boilers, and boiler flues. Building warmed by steam or hot water, gas apparatus for towns, facories, and private dwellings. 29 4*

THE GREAT PARIS EXHIBITION, 1855.—MESSRS. GARDISSAL & CO., No. 44 Rue de Marais—Have the pleasure to announce to the manufacturers and artizans of the United States that they have opened an office at the above named place, for the purpose of taking charge of goods and machinery, and superintend all requisite details for the Great French Exhibition, effecting sales of goods, machinery, patents, &c. They will also attend personally to the purchase of any article of French manufacture, useful or ornamental, with care, and at a low price. MESSRS. GARDISSAL & CO. are also publishers of THE INVENTION, a monthly journal devoted to the ARTS, SCIENCE, and MECHANICS, and are desirous to publish in its columns engravings of American inventions patented in France, and also such machines as are placed on exhibition.—They offer this excellent facility upon such terms as will meet the favor of all. Patentees who desire to sell their French patents, can consult with Messrs. Gardissal & Co., and employ their agency for that purpose. They would also state, that it will be of the utmost importance to American exhibitors that their articles should be carefully attended to, and their advantages explained during the Exhibition. This will conduce to their success, and tend very much towards sustaining the well-earned reputation of American genius for useful and practical inventions. Messrs. Gardissal & Co. refer by permission to Messrs. Munn & Co., Scientific American Office, New York. S. H. Wales Esq., New York State Commissioner to the French Exhibition.

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STAVE AND BARREL MACHINERY—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 13 tf

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NORCROSS ROTARY PLANING MACHINE—The Supreme Court of the U.S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringemet of the Woodworth Patent.

Rights to use N. G. Norcrois's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.
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Science and Art.

History of Reaping Machines.—No. 25.

On the 25th of April, 1854, a patent was granted to Wm. F. Ketchum, of Buffalo, N. Y., (assignor to Rufus S. Howard,) for an improved method of making cast iron guard teeth for harvesters. The old method of casting iron teeth left the surfaces so chilled, and the slit for the cutter to play being so thin, it could not be made smooth. The improved tooth remedied this method of manufacture by casting each part of proper form, but with the parts on each side of the slit at a considerable angle to each other. In casting them thus, there is sufficient space between the shanks to admit of their being cast in an ordinary sand mold. After molding, they are malleableized and dressed up with ease, and the shanks closed and made ready for use. This is a cheap method of manufacturing such guard fingers, (see claim, page 267, Vol. 9., Sci. Am.) On page 299, same volume, are the claims of a patent for a clover harvester, granted to T. S. Stedman of Murray, N. Y., on the 23rd of May, 1854. The claims (six in number) of the re-issued patent of Nelson Platt, formerly of Ottawa, Ill., will be found on the same page. The assignees of this patent are Messrs. Seymour, Dayton, & Morgan, of Brockport, N. Y., (see illustration of this patent, on page 160, this series of articles.)

On June 13th, 1854, Ira Reynolds, of Republic, Ohio, obtained a patent for a double series of double edged shear blades, supported at their rear ends by reciprocating bars, to which they are pivoted and regulated by set screws; also for a method of elevating and depressing the grain gatherer while the machine is in motion, (see claims on page 323, Vol. 9, Sci. Am.) On the same page is the claim of a patent granted to Bronson Murray, of Ill. (assigned to T. R. Spencer, Geneva, N. Y., assignor to J. S. Wright, of Chicago, Ill.,) for making the rear serratures of the sickle-blade sickle edged, except the rear projecting points, which latter construction he disclaimed as being the invention of Henry Green. On the 27th of June following, a patent was granted to George Esterly, of Heart Prairie, Wis., embracing three claims; the first for making the sickle with projections on alternate sections; second, grinding off the feather edge made on the sickle by the cutting chisel; third, attaching a plow to the sickle beam, (see claims on page 342, Vol. 9, Sci. Am.) On page 412, same volume, there is the claim of a patent granted to A. Bruer, Mechanicsbugh, Ill, for a corn harvester, relating to an arrangement of oblique cutters and guide shafts. Arranging the cutters for making an oblique cut on corn stalks, is the correct mode.

On page 70, Vol. 9, Sci. Am., there is an illustrated article reviewing the claims of various inventors, in which the merits of their inventions are criticised. Two forms of cutters are shown, and three forms of guard teeth, viz: McCormick's, the common tooth, and Forbush's tooth. An answer to the said article, by J. M. Thomas, of Ill., was published on page 107. A beautiful perspective view, with a full description of Homer Atkins' automatic reaper and self-raker, will be found on page 41, Vol. 9, Sci. Am.; the date of the patent is Dec. 21, 1852.

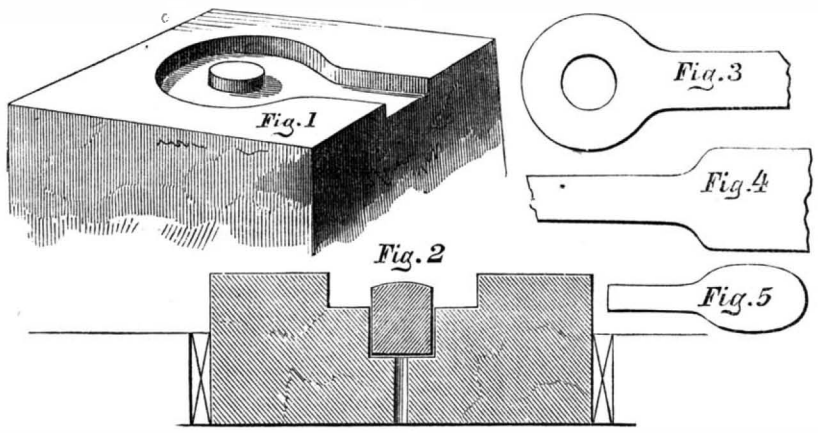
Inspection of Mines in England.

Mr. Dickinson, the Mining Inspector for Lancashire, Cheshire, and North Wales, in his report ending the 31st Dec., says:—"The loss of life to persons employed in and about the whole of the collieries of Great Britain, as ascertained for 1851 and 1852, is averaged at 985 per annum. The total output of coals is not correctly known, but it may be stated at about 54,000,000 tuns. The average loss of life, therefore, at this estimate, for the whole of Great Britain is one life per 54,822 tuns of coal. In previous years the mortality was probably greater; many improvements as to the health and safety of the miner having been introduced into collieries by the passing of the act for the inspection of coal mines, in 1850. Not more than three per cent. of the explosions of fire-damp occur in mines where safety lamps are professedly used. The ventilation of English coal mines is generally produced by a furnace, which being kept burning at the upper part of the upcast shaft, heats or rarefies the air, so that it ascends, whilst cold air necessarily descends another shaft into the mine to supply its place. In Belgium, where the science of ventilation is much better understood than in England, the furnaces are all being replaced by machines, which pump out the air, and are more economical.

For the Scientific American.

Forging the Eyes of Suspension Rods.

In forging the eyes for the suspension rods of the roof of the Capitol Extension, we have used—for the first time, I believe—a mode of punching and swaging iron, which promises great rapidity and economy in all such work, such as in making the eyes for Bollmand's bridges, for example. The eyes are forged



and a large faced hammer block, and the anvil with the recessed face substituted. The first effort in placing the hot iron over the die, is to spread the iron above the steel center pin, and swage the eye, thus increasing its diameter. As soon as the iron is forced down into contact with the bottom of the die, it is turned over and hammered with the other side up; the impression is now made on the other side, and the blank is loosened; one or more turns, and a few blows of the hammer, so loosens the blank, that a light tap with a hand hammer drives it out, and the eye is completely finished. The edges of the die of the center pin have a little draw to prevent the eye from sticking. The whole operations are rapid and easy to the workmen, and, beside, the process is economical. The eyes, like all work made in dies, are exactly alike. The waste and chipping amount to about one pound in a hundred—a very small amount.

The economy of this mode of manufacture in making Bollman's Bridges, must amount to many thousands of dollars in a large bridge, and I only wonder that any one with a steam hammer did not fall upon it the first time he tried a heavy job. To Mr. Samuel Champion, foreman of our smith's shop, belongs the credit of this mode of working the iron. I desired him to prepare dies to work the eyes, when he suggested a print, as a guide in punching them, which we intended to do by hand. The effect of this print, which was only about the eighth of an inch deep, showed that by making it a little deeper, the eye would be punched. The steel pin was then adopted, and the results you have in the foregoing. M. C. Meigs.

Capt. of Engineers in charge of the U. S. Capitol Extension, and of the Washington Aqueduct.

British Railways.

The traffic returns of British railways in 1854, show an aggregate of 18,541,855*l.* on 7,300 miles of railway, being at the rate of 2,604*l.* per mile. In addition to the published returns, there were receipts upon 792 miles of railway amounting to about 1,458,670*l.*, which, with the above sum of 18,541,855*l.*, makes a total of 20,000,525*l.*, as the traffic receipts for railways in the United Kingdom in 1854. The length of line open for traffic at the end of the year, was about 8,028 miles, the traffic receipts on the whole being at the rate of 2,491*l.* The cost of construction amounted to 273,860,000*l.*, being at the rate of 34,020*l.* per mile. The total receipts on 7,700 miles in 1853 amounted to 17,920,530*l.*, showing an increase in favor of 1854 of 2,079,995*l.*, or above 11 per cent. The published traffic returns of railways in 1843 amounted to 4,843,000*l.*, yielding an average receipt of 3,045*l.* per mile; and in 1854 to 18,541,000*l.*, yielding an average receipt of 2,604*l.* per mile. The capital expended on these lines up to July, 1843, amounted to 57,635,100*l.*, and in 1854, on the linesis question, to 255,610,000*l.*, showing an increase in the annual traffic of 13,698,000*l.*, and in the capital expended of 197,974,900*l.* The mileage has increased during that period from 2,000 miles to 8,000 miles, and the average cost per mile remained about the same, varying from 34,000*l.* to 35,000*l.* per mile. The total length of British railways is about one-third that of the United States, but their cost of construction, we are positive, is three times more, amounting, in round numbers, to $1,278,050,000.

Coal of Pennsylvania.

One amongst the many remarkable instances of the fruits of labor judiciously applied to mining, we find furnished by the Pottsville *Register*, in the account of the proceedings at a presentation of plate to Mr. E. W. McGinnes, of that place.

A few years ago, E. W. McGinnes, of Pottsville, with many others, became impressed with the opinion that the great white-ash coal veins of the Broad Mountain range ran under the red-ash series of the Schuylkill basin; and believing, as he did, in consequence of the numerous anti-clinical axes which occur in that basin, that these white-ash veins could be reached at a depth not too great for practical and economical working, he boldly commenced sinking a gigantic perpendicular shaft, on the estate of Messrs. Carey & Hart, at the village of St. Clair, about two miles north of Pottsville. After penetrating a number of valuable veins, in his descent into the bowels of the earth, he finally struck, at a depth of some four hundred and thirty feet from grass, the celebrated mammoth white-ash vein of the Broad Mountain, affording, at this spot, *thirty feet of solid coal!* The truth of this interesting theory, though long entertained by the colliery miners and geologists, but with serious doubts as to its practical value, was thus completely demonstrated and established, and the natural effect of it will be, of course, to add very largely to the value of coal lands and the coal trade of this extraordinay region.

Work in the Country.

A correspondent writing to us from Buffalo Grove, Ill., states that there is plenty of work for faithful laborers in Northern Illinois, that wages are high, and provisions plenty and at reasonable prices. Some of the suffering poor in this city, who are disposed to labor, he believes would do well to go out there.

LITERARY NOTICES.

L'Invention—This is the title of a monthly journal of Art, Science, and Mechanics, conducted by M. Gardissal, No. 29 Boulevard St. Martin, Paris, France. It is a very useful publication, and faithfully illustrates the progress of invention in France. It embraces the subjects of mechanics, chemistry, and agriculture, with numerous engravings. Mr. Gardissal is assisted in his labors by the Messrs. Tolhausens, who bring to the work much ability and scientific research. The Technological Dictionaries advertised on another page, are published by the same concern. They are very useful publications and ought to be possessed by every student.

The North British Review—The republished number of this most able Review, for this quarter, has just been issued by Messrs. Leonard Scott & Co., No. 54 Gold street, this city. It contains nine grand articles on different subjects, all of great interest, and stamped with learning and genius. This Review is marked with a sound religious and freedom-loving spirit. It contains an able article on the Electric Telegraph, the substance of which we shall present next week.

Gauger's Hand Book—This is a very neat little book, dedicated to John Cochrane, Surveyor of the Port of New York. It gives a great amount of useful information respecting the measuring of liquids in vessels. It is a complete and concise treatise on Gauging as practiced by the gaugers of the Customs at the Port of New York.

Nelson's American Lancet—This monthly Journal of practical medicine, published and edited at Plattsburg, N. Y., by Dr. Horace Nelson, always contains a great amount of original and useful information. The number for this month continues the Report of Dr. Bedford's Clinical Lectures in the University of this city.

The National Magazine, for April, is a fine number; we cannot speak in terms too high of this excellent monthly: the tone is christian, and is elevated above the common trash of the day. Carlton & Phillips, publishers, New York.

Native American Review.—A new monthly with this title has made its appearance, and, as its name imports, will advocate "American" principles, taking for its motto "Americans shall rule their country." It differs somewhat in its style from other monthlies published in this country, being more like the English quarterlies in its arrangement. Its general appearance is very creditable, and to judge from the contents of this first number, it will prove a valuable addition to our current literature. It is published by J. W. Moore, 193 Chestnut street, Philadelphia.

MECHANICS

Inventors, and Manufacturers

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